Vol. 1045 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

August 7, 1984

U.S.
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OF COMMERCE

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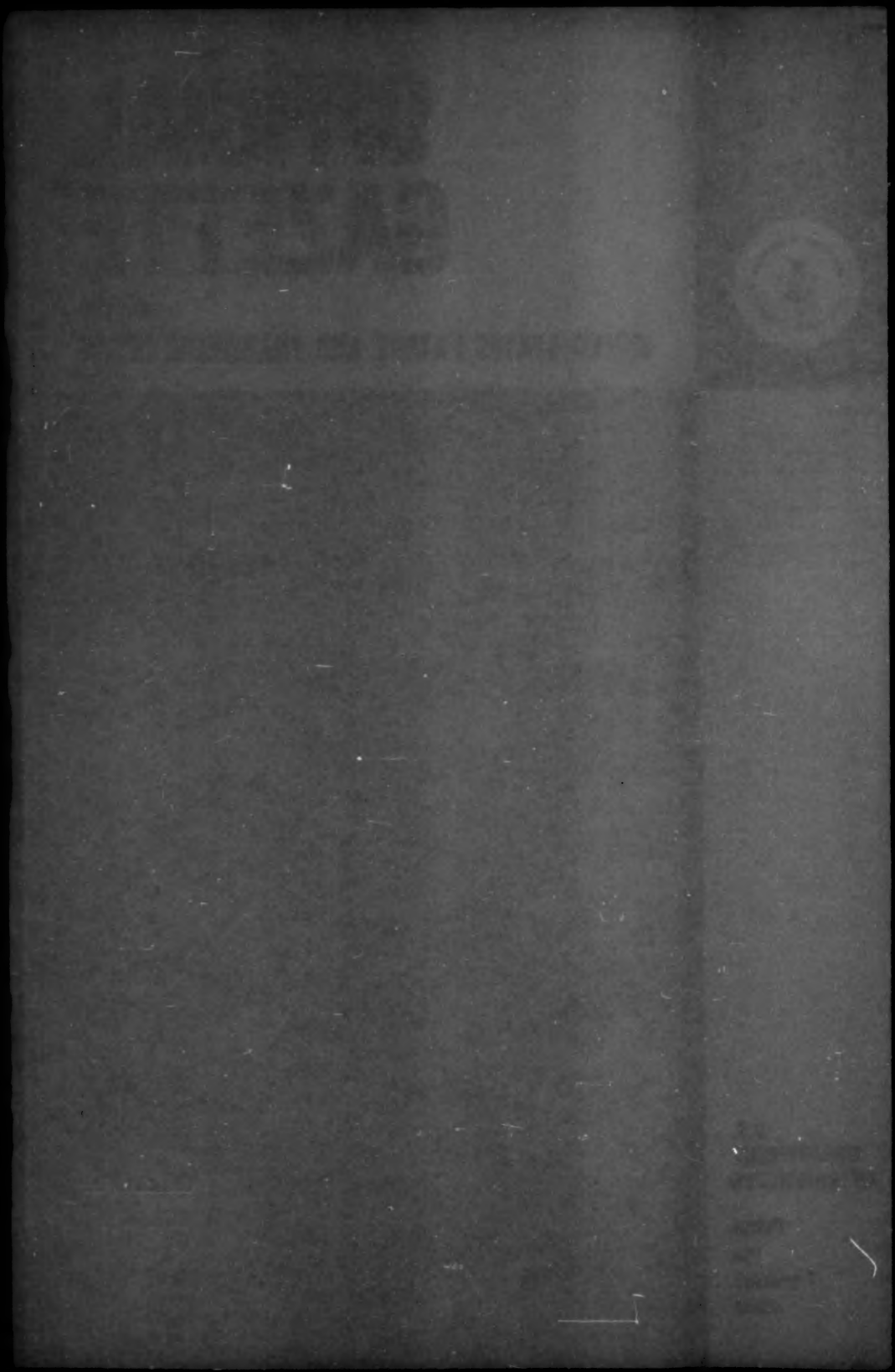
Office



OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

August 7, 1984 Volume 1045 Number 1

CONTENTS

		Page
Patent and Trademark Office Notices		
Patent Cooperation Treaty (PCT) Information	1045 OG	2
Reissue Applications Filed	1045 OG	2
Requests for Reexaminations Filed	1045 OG	2
Errata	1045 OG	2
Availability of Patents and Trademarks Style Manual	1045 OG	3
Service by Publication	1045 OG	3
Out-of-Town Requests for Files	1045 OG	3
Extension of Time for Filing Notices	1045 OG	4
Patent Certificates of Correction	1045 OG	5
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1045 OG	6
Condition of Patent Applications	1045 OG	7
Defensive Patent Publication (104,501)		1
Reissue Patents Granted (31,640)		3
Plant Patents Granted (5,267)		5
Patents Granted		
General and Mechanical (4,463,455)		7
Chemical (4,464,180)		261
Electrical (4,464,540)		361
Design Patents Granted (274,954)		451
Index of Patentees		PI 1
Indices of Reissue, Design and Plant Patentees		PI 50
Index of Applicants of Defensive Publications		PI 52
Classification of		
Patents (Including Reissues)		PI 53
Designs, Plants and Defensive Publications		PI 56
Geographical Index of Residence of Inventors		
Patents (Including Reissues)		PI 57
Designs, Plants and Applicants of Defensive Publications		PI 58
Change of Address Form and Subscription Order Form		Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1042 O.G. 45 on May 15, 1984.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced in the *Official Gazette* at 1039 O.G. 142 on Feb. 21, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Apr. 13, 1984. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,580,829, Re. S.N. 616,947, Filed May 30, 1984, Cl. 204/159.17, PROCESS FOR IRRADIATING POLYVINYLIDENE FLUORIDE AND A COMPATIBLE POLYFUNCTIONAL MONOMER AND PRODUCT THEREOF, Vincent L. Lanza, Owner of Record: *Raychem Corp., Menlo Park, Calif.,* Attorney or Agent: Robert Douglas Lyon, et al., Ex. Gp.: 151

3,675,377, Re. S.N. 611,460, Filed May 17, 1984, Cl. 52/2, INFLATABLE-DEFLATABLE FLEXIBLE STRUCTURAL COMPONENT, Charles A. Suter, Owner of Record: *Goodyear Aerospace Corp., Akron, Ohio,* Attorney or Agent: Paul E. Milliken, et al., Ex. Gp.: 354

3,922,377, Re. S.N. 604,004, Filed Apr. 26, 1984, Cl. 426/645, HEAT-PROCESSED DEHYDRATED BACTERIOLOGICALLY-STABLE PORK RIND PRODUCT AND PROCESS FOR PREPARING SAME, Kenneth F. Whittle, Owner of Record: *Protein Foods Ltd., Tipton, England,* Attorney or Agent: Leo A. Rosetta, et al., Ex. Gp.: 132

4,371,708, Re. S.N. 611,805, Filed May 18, 1984, Cl. 568/31, 4-SUBSTITUTED 3, 3-DIMETHYL-BUTAN-2-ONES, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS INTERMEDIATE PRODUCTS, Wolfgang Kramer, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Arnold Sprung, et al., Ex. Gp.: 126

4,382,447, Re. S.N. 610,840, Filed May 16, 1984, Cl. 132/33R, HAIR ROLLER, Dov Z. Glucksman, Owner of Record: *Inventor,* Attorney or Agent: John S. Roberts, Jr., Ex. Gp.: 332

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,741,439, Reexam. No. 90/000,578, Requested: June 21, 1984, Cl. 222/103, VISCOUS LIQUID DISPENSER, Roger Keith Vehrs, Owner of Record: *Ben D. Tobor, Houston, Tex.,* Attorney or Agent: Hubert E. Dubb, Ex. Gp.: 311, Requester: Ben D. Tobor, Houston, Tex.

4,311,515, Reexam. No. 90/000,586, Requested: July 9, 1984, Cl. 71/108, SUBSTITUTED DIPHENYL ETHERS HAVING HERBICIDAL ACTIVITY, William S. Grove, Owner of Record: *PPG Industries, Inc., Pittsburgh, Pa.,* Attorney or Agent: Edward J. Whitfield, Ex. Gp.: 129, Requester: Terence P. Strobaugh, Philadelphia, Pa.

4,364,424, Reexam. No. 90/000,584, Requested: July 6, 1984, Cl. 383/024, END WALL CLOSURE FOR BULK MATERIAL TRANSPORT BAG, Peter J. Nattrass, Owner of Record: *Bulk Lift International, Inc., Carpentersville, Ill.,* Attorney or Agent: Kinzer, Plyer, et al., Ex. Gp.: 241, Requester: Cajun Bag and Supply Co., Inc., Crowley, La.

4,411,302, Reexam. No. 90/000,588, Requested: July 10, 1984, Cl. 152/427, SNAP-IN TIRE VALVE, Harold A. Kuypers, Owner of Record: *Inventor,* Attorney or Agent: Dallett Hoopes, Ex. Gp.: 131, Requester: Michelin & Cie, Clermont-Ferrand Cedex, France

Errata

The following registration numbers were inadvertently listed as canceled in the "Trademark Registrations Canceled, Section 8" section of the Official Gazettes listed below:

1,049,031	TM 626	Feb. 22, 1983
1,050,553	TM 491	Mar. 15, 1983
1,057,049	TM 366	June 21, 1983
1,031,713	TM 293	Aug. 9, 1983
1,061,541	TM 430	Aug. 16, 1983
1,075,922	TM 442	Mar. 20, 1984
1,076,303	TM 601	Mar. 27, 1984
1,021,243	TM 515	May 15, 1984
1,081,166	TM 847	May 29, 1984

Consequently, the above-identified registrations are still active.

MARK M. NEWMAN,
July 3, 1984. *Director Trademark Examining Operations.*

Errata

The following numbers were inadvertently renewed in the "Trademarks Registrations Renewed" section of the Official Gazettes listed below:

742,316	TM 241	Nov. 8, 1983
761,263	TM 316	Apr. 10, 1984
754,941	TM 117	Nov. 1, 1983

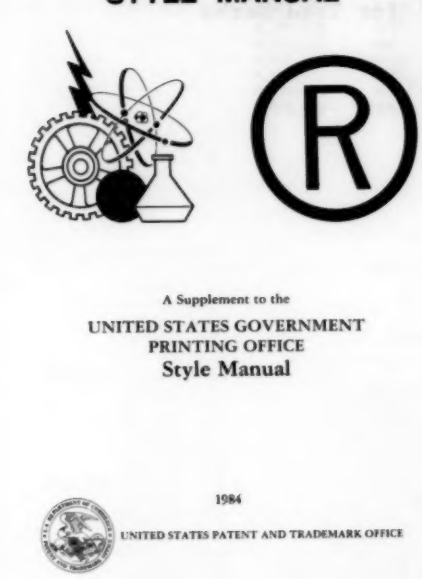
Consequently, the above-identified registrations are not renewed.

MARK M. NEWMAN,
Director Trademark Examining Operation.

July 3, 1984.

Availability of Patents and Trademarks Style Manual

The latest edition of Patents and Trademarks Style Manual will be available to the patent and trademark community soon. This edition will be published as a separate supplement to the GPO Style Manual. It is the first revision since 1973, and will be available in looseleaf form. The cover of this supplement is illustrated below:



Orders are now being accepted by the Superintendent of Documents. The stock number is 003-004-00606-4. Direct inquiries to:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

Checks for orders should be made payable to the Superintendent of Documents. If a Deposit Account with the Superintendent of Documents is to be used, please include the Deposit Account Number with the order.

THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

June 29, 1984.

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceedings sent by certified mail to the registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assignee or legal representative, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Aerofall Mills Inc., assignee of Aerofall Mills Limited, New York, N.Y., Reg. No. 596,684, for the mark "AEROFALL", Can. No. 14,067.

ERMA S. BROWN,
Deputy Clerk of the Trademark Trial and Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Out-of-Town Request for Files

Delays are being experienced in receiving files ordered from the Federal Records Center in Suitland, Md. Therefore, more time must be allowed when out-of-town requestors are ordering patented files or abandoned or registered trademark files in advance of their arrival in the area. Until recently, a five-day notice was sufficient to obtain a file located in the Federal Records Center. Now we are suggesting that ten days be allowed when ordering Suitland files. A 24-hour notice is still normally adequate when the file is located in the PTO File Repository in Crystal City. Out-of-town requests for files should be directed to Ms. Jacqueline Waldo on (703) 557-2977. Requestors will be notified by phone, prior to planned arrival date, whether or not the requested file will be available.

THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

July 10, 1984

OFFICIAL GAZETTE NOTICE

EXTENSION OF TIME FOR FILING NOTICES OF OPPOSITION TO MARKS PUBLISHED IN THE OFFICIAL GAZETTES, DATED JUNE 19 AND JUNE 26

Copies of the Official Gazette dated June 19, 1984 were not mailed until June 22, 1984 and copies of the Official Gazette dated June 26, 1984 were not mailed until June 29, 1984. Therefore, for marks published in the Official Gazette dated June 19, 1984 and for marks published in the Official Gazette of June 26, 1984, Notices of Opposition filed by July 23, 1984 and July 30, 1984, respectively, will be considered timely.

7-12-84
(Dated)

Margaret M. Laurence
Assistant Commissioner
for Trademarks

PATENT NOTICES

Certificates of Correction for the Week of Aug. 7, 1984

Re. 31,552	4,395,504	4,421,946	4,430,914
4,100,572	4,396,931	4,422,123	4,431,259
4,150,762	4,400,284	4,422,941	4,431,405
4,172,103	4,401,643	4,423,129	4,431,453
4,272,835	4,403,277	4,423,971	4,432,936
4,289,686	4,403,514	4,424,211	4,432,957
4,291,024	4,409,090	4,424,300	4,433,256
4,310,453	4,410,630	4,424,567	4,433,688
4,346,458	4,411,276	4,424,582	4,433,826
4,366,073	4,411,736	4,424,710	4,434,166
4,367,230	4,411,750	4,426,132	4,434,170
4,369,251	4,412,025	4,426,632	4,434,442
4,369,563	4,413,459	4,427,036	4,434,598
4,370,110	4,414,133	4,427,143	4,434,955
4,374,725	4,415,908	4,427,288	4,434,969
4,374,739	4,417,456	4,427,404	4,435,172
4,376,147	4,418,375	4,427,445	4,435,208
4,376,955	4,418,463	4,427,498	4,435,411
4,378,806	4,420,790	4,427,651	4,435,542
4,383,559	4,420,874	4,427,830	4,436,980
4,391,208	4,420,944	4,428,825	4,437,972
4,391,285	4,421,235	4,428,999	4,438,094
4,392,254	4,421,792	4,429,321	4,438,280
4,394,079	4,421,825	4,429,748	4,438,744
4,394,444	4,421,861	4,430,279	4,441,525
4,395,106	4,421,873	4,430,840	4,442,104

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public L ibrary	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6670
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF June 23, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-21-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-29-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	6-24-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-21-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—B. R. GRAY, Director	6-30-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	8-25-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-24-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	10-29-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	4-29-81
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	3-29-82
DESIGN, GROUP 290—K. L. CAGE, Director	3-12-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—(Vacant)	9-14-82
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	6-10-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	6-08-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	5-14-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-29-81

Expiration of patents: The patents within the range of numbers indicated below expire during June 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,323,134 to 3,328,805, inclusive

Plant Patents ..... Numbers 2,766 to 2,749 inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED AUGUST 7, 1984

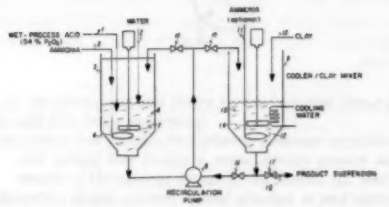
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T104,501
PRODUCTION OF HIGH-ANALYSIS AMMONIUM ORTHOPHOSPHATE SUSPENSION FERTILIZERS BY A NEW BATCH-TYPE PROCESS

Thomas M. Jones, 208 Stephenson Ct., Sheffield, Ala. 35660, and Lucian A. Kendrick, Jr., 1025 Dixie Ave., Florence, Ala. 35630

Filed Oct. 28, 1983, Ser. No. 546,261
Int. Cl.³ C05B 7/00
U.S. Cl. 71—34
1 Sheets Drawing. 29 Pages Specification



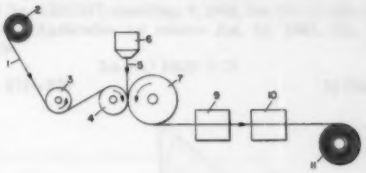
BATCH PRODUCTION OF AMMONIUM ORTHOPHOSPHATE SUSPENSION FERTILIZERS

An improved process for the production of highly concentrated ($N\text{-}P_2O_5$) suspension fertilizers effected by the ammoniation of wet-process or other impure orthophosphoric acids in batch-type equipment. The underlying concept which goes to the gist of the instant invention involves the use of a heel of product from a previously prepared batch to provide nuclei and a suitable environment for the conversion of the metallic impurities therein into crystalline habits rather than the usual highly undesirable form of metallic impurity gel-like compounds, which gels cause extremely high viscosities, nonpourability, and complete destruction of fluidity in concentrated ammonium phosphate suspension fertilizers prepared by prior-art procedures. Also, during the ammoniation of acids by the instant process, the heel maintained therein prevents severe thickening due to mass crystallization of monoammonium phosphate, which severe thickening normally results in either/or extremely slow further ammoniation and excessive ammonia losses. Practice of this method is simple, economical, versatile, and can be performed in readily available equipment.

T104,502
PROCESS FOR MAKING METAL/PROPYLENE POLYMER LAMINATES

Chia-Seng Liu, 9 White Clay Crescent, Meeting House Hill, Newark, Del. 19711

Continuation of Ser. No. 394,050, Jun. 30, 1982, abandoned, which is a continuation of Ser. No. 249,786, Apr. 1, 1981, abandoned, which is a continuation of Ser. No. 122,898, Feb. 20, 1980, abandoned, which is a continuation-in-part of Ser. No. 46,526, Jun. 7, 1979, abandoned. This application Jan. 9, 1984, Ser. No. 569,552
Int. Cl.³ B29D 7/02
U.S. Cl. 156—244.11
1 Sheets Drawing. 15 Pages Specification



Disclosed is a process for the lamination of metal and propylene polymer layers, comprising extrusion coating the polymer onto the metal, cooling the polymer until it solidifies, postheating the laminate at a temperature above the melting point of the polymer, and quenching the laminate.

DEFENSIVE PUBLICATIONS

PUBLISHED AUGUST 7, 1984

REISSUES

AUGUST 7, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,640

[NEUTRAL] BUOYANCY INTRAOCULAR LENS DEVICE

Jerre M. Freeman, Ste. 501, Crew Wing, 176 S. Bellevue, Memphis, Tenn. 38104

Original No. 4,077,071, dated Mar. 7, 1978, Ser. No. 666,651, Mar. 15, 1976. Application for reissue May 31, 1979, Ser. No. 44,032

Int. Cl.³ A61F *1/16, 1/24*

U.S. Cl. 3—13 **22 Claims**

21. An intraocular lens device for implantation into a human eye, said lens device comprising:

an optical lens suitable for replacing a human crystalline lens, said optical lens having a mean density greater than the density of the aqueous humor of the human eye; and

buoyancy means external of and attached to said optical lens, said buoyancy means comprising a plurality of members having a density less than the density of the aqueous humor of the human eye and said buoyancy means adapted to extend within at least one of the anterior and posterior chambers of the human eye for providing at least a degree of buoyant uplift for the optical lens when the intraocular lens device is implanted into the human eye.

Re. 31,641

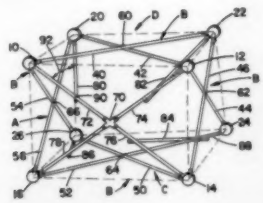
COLLAPSIBLE ARTICULATED WALL STRUCTURE

David L. Derus, Cleveland Heights, Ohio, assignor to Nomadic Structures, Inc., Alexandria, Va.

Original No. 4,276,726, dated Jul. 7, 1981, Ser. No. 104,395, Dec. 17, 1979. Application for reissue Dec. 22, 1982, Ser. No. 452,220

Int. Cl.³ E04H *12/18*

U.S. Cl. 52—109 **17 Claims**



3. [The structural section as set forth in claim 1 wherein] *A collapsable, articulated structural section which is moveable between an erected configuration and a collapsed configuration, said structure comprising:*

a first plurality of pivot means disposed to be substantially in a first plane in said erected configuration and to be substantially adjacent each other in said collapsed configuration;

a second plurality of pivot means disposed to be substantially in a second plane in said erected configuration and to be substantially adjacent each other in said collapsed configuration, said second plane being substantially parallel to said first plane;

a plurality of pivotally interconnected side links for connecting said first plurality of pivot means with said second plurality of pivot means, each of said links being connected with one of said first plurality of pivot means and one of said second plurality of pivot means;

a face pivot means;

a plurality of face links, each of said face links connected with said face pivot means and with one of said first plurality of pivot means; and

a locking link for locking the structural section in said erected configuration, said locking link being pivotally connected near one of its ends with a first one of said plurality of face links and operatively connected near the other of its ends with a first one of second plurality of pivot means, said locking link **[is]** *being* pivotally connected with one of said pivotally interconnected side links which, in turn, is pivotally connected to the first one of said second plurality of pivot means.

Re. 31,642

ANGLE AND TILT IMPLEMENT ASSEMBLY

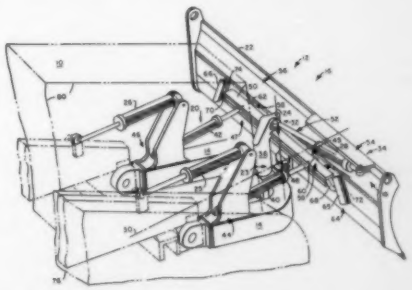
Jerrold R. Asal, Joliet, and James A. Olthoff, South Holland, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. i³CT/US79/00045, §371 Date Jan. 29, 1979, §102(e) Date Jan. 29, 1979, PCT Pub. No. WO80/01584. PCT Pub. Date Aug. 7, 1980.

Original No. 4,221,267, dated Sep. 9, 1980, Ser. No. 12,163, Jan. 29, 1979. Application for reissue Jun. 11, 1981, Ser. No. 272,626

Int. Cl.³ E02F *3/76*

U.S. Cl. 172—821 **16 Claims**



1. In an implement assembly **(12)** having a frame **(14)** having a longitudinal axis **(30)**, an implement **(16) [**directly pivotally connected to said frame **(14)]**, *a pivot connection (23) defining a substantially vertical axis (24) pivotally connecting said implement (16) directly to said frame (14),* first means **(18)** for controllably pivotally moving said implement **(16)** about said longitudinal axis **(30)** relative to said frame **(14)** and second means **(20)** for controllably pivotally moving said implement **(16) [**in a plane passing through said longitudinal axis **(30)** relative to said frame **(14)**, said frame **(14)** being of a construction sufficient for supporting said implement **(16)]** *about said substantially vertical axis (24),* the improvement comprising:

a subframe **(50)** *having a middle portion(52)* pivotally connected to said frame **(14) [**and said second means **(20)** and positioned adjacent and in contactable relationship with said implement **(16)]** *on said substantially vertical axis (24)at a location vertically spaced from said pivot connection (23)of said implement (16) with said frame (14) and being pivotally movable about said axis (24);* and

said implement (16) being *totally supported by said frame (14)and* pivotally movable about said longitudinal axis (30) [along said subframe (50) and pivotally movable in said plane with said subframe (50)] *in sliding relationship with said subframe (50).*

Re. 31,643

HOLD CIRCUIT FOR TELEPHONE SYSTEM

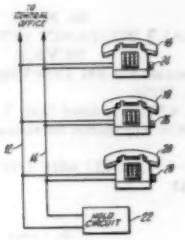
Herbert H. Waldman, 1739 52nd St., Brooklyn, N.Y. 11204

Original No. 4,243,844, dated Jan. 6, 1981, Ser. No. 943,679, Sep. 19, 1978. Application for reissue Jan. 6, 1983, Ser. No. 456,257

Int. Cl.³ H04M *1/00*

U.S. Cl. 179—81 R **55 Claims**

1. A telephone line hold circuit connected with a telephone line and at least one telephone instrument connected to said telephone line for establishing a hold condition on the telephone line, said telephone instrument having an on-hook state and an off-hook state, said telephone instrument including switch means for imposing an electronic actuating signal onto said telephone line independent of said hold circuit upon manual actuation of said switch means, said hold circuit comprising, in combination, responsive means and line-seizure means, said actuating signal causing said responsive means to produce an output voltage, said output voltage [affecting] *effecting* activation of said line-seizure means to seize said telephone line for establishing said hold condition, and said manual actuation



of ssid switch means being operative to [affect] *effect* said hold condition only in said off-hook state *of said telephone instrument.*

PLANT PATENTS

GRANTED AUGUST 7, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,267

STRAWBERRY PLANT 'FERN'

Royce S. Bringhurst, Davis, and Victor Voth, Santa Ana, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 23, 1982, Ser. No. 452,700

Int. Cl.³ A01H *5/03*

U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated and identified by the characteristics enumerated above.

5,268

STRAWBERRY PLANT 'SANTANA'

Victor Voth, Santa Ana, and Royce S. Bringhurst, Davis, both of Calif., assignors to The regents of the University of California, Berkeley, Calif.

Filed Dec. 23, 1982, Ser. No. 452,698

Int. Cl.³ A01H *5/03*

U.S. Cl. Plt.—48 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated and identified by the characteristics enumerated above.

5,269

CHRYSANTHEMUM PLANT NAMED STARFIRE

William E. Duffett, Salinas, Calif., and Grace H. Mack, 108 Wahackme Rd., New Canaan, Conn. 06840, assignors to Grace H. Mack, New Canaan, Conn.

Filed Oct. 21, 1982, Ser. No. 435,695

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—77 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant known by the name Starfire, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form, decorative capitulum type, durable inflorescence, white ray floret color, diameter across face of capitulum up to 75 mm., tall plant height, spreading branching pattern, average natural season flowering date of September 15, and average flowering response period of seven (7) weeks in photoperiodic controlled short day programs.

PLANT PATENTS

GRANTED AUGUST 2, 1994

PATENTS

GRANTED AUG. 7, 1984

ERRATA

For CLASS	See PATENT NO.
162–041	4,463,475
188–067	4,463,481
128–062	4,463,485
446–222	4,463,513
446–294	4,463,514
446–409	4,463,515
446–320	4,463,516
446–421	4,463,517
446–237	4,463,518
446–443	4,463,519
446–443	4,463,520
250–289	4,464,016
527–300	4,464,523
371–050	4,464,747

PATENTS

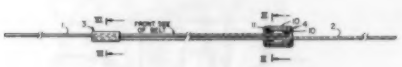
GRANTED AUGUST 7, 1984

GENERAL AND MECHANICAL

4,463,455
TWO PART ADJUSTABLE BELT WITH LOCKING MEANS

Alexis V. Kirk, New York, N.Y., assignor to Somersett Moon Ltd., New York, N.Y.

Filed Dec. 15, 1981, Ser. No. 330,844
Int. Cl.³ A41F *3/02, 9/00, 15/00*
U.S. Cl. 2—338 **14 Claims**



1. A two-part adjustable belt with locking means, comprising:

first and second elongated belt members (1, 2), a portion of the length of said first and second belt members overlapping each other, said overlapping belt portions having longitudinal opposite side edges substantially aligned with each other, and said belt members each having first and second substantially flat opposing faces, the first opposing faces of each of said belt members contacting each other at said overlapping portions, and said second opposing faces of said belt members facing away from each other;

first and second transverse members (3, 4) substantially completely encircling a portion of the overlapping portions of said first and second belt members;

means connecting one of said transverse members (3) to an end portion of one of said belt members (2);

means connecting the other of said transverse members (4) to an end portion of one of said belt members (1);

at least one of said transverse members (3, 4) including a generally C-shaped metallic strip clamp means (11, 21) for clamping said overlapping belt portions to each other to substantially prevent relative sliding movement between said overlapping portions of said first and second belt members, said generally C-shaped metallic strip having a body portion and free arm portions extending from said body portion, said C-shaped metallic strip encircling at least a portion of said overlapping belt members and extending continuously around said aligned edges on both sides of said overlapping belt portions such that continuously connected portions of said C-shaped metallic strip clamp means contacts both of said second faces of said overlapping belt portions with said free arm portions contacting the same second face and clamps said second faces toward each other so that said first faces of said overlapping belt portions are pressed toward each other and clampled in contact with each other to prevent relative movement therebetween, said metallic strip clamp means being bendable to clamp said overlapping portions of said belt members against each other upon bending of said free arms of said metallic strip toward said body portion of the metallic strip, thereby maintaining the length adjustment of said belt.

4,463,456
PROTECTIVE HELMET

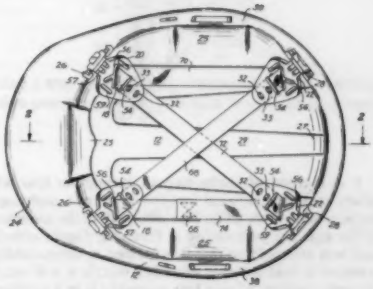
George N. Hanson, New York, N.Y., assignor to Eastern Safety Equipment Co., Inc., Long Island City, N.Y.

Filed Sep. 9, 1982, Ser. No. 416,199
Int. Cl.³ A42B *3/02*
U.S. Cl. 2—416 **7 Claims**

1. An improved suspension assembly for a protective helmet of the type having a plastic shell forming a volume having a rim, top wall, rear wall, front wall, and side wall portions and two front and rear tab recesses formed on the front and rear wall portions of the rim, the improvement, in combination, comprising:

flexible front and rear tab means mounted in each of said recesses, and

strap means slidably mounted through said tab means, said strap means extending between said front and rear tab means over two equal diagonal distances and two equal side distances, said strap means at said diagonal distances being in spaced relationship from said top wall portion and at said side distances being in spaced relationship from said



side wall portions, said strap means at said diagonal distances being disposed nearer to said top wall portion than said strap means at said side wall distance,

said flexible tab means being for slidably mounting said strap means at said diagonal and side distances and for flexibly responding to vertical and lateral pressures;

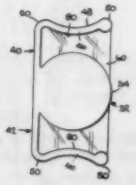
said strap means being for flexibly resisting said vertical and lateral pressures,

whereby the head of a user of the helmet is separated from the shell both vertically and laterally during normal and abnormal pressure occurrences.

4,463,457
INTRAOCULAR LENS AND METHOD OF POSITIONING THE SAME IN AN EYE

Charles D. Kelman, 269-70 Grand Central Pkwy., Floral Park, N.Y. 11005

Filed Sep. 24, 1982, Ser. No. 422,373
Int. Cl.³ A61F *1/16, 1/24*
U.S. Cl. 3—13 **10 Claims**



1. An intraocular lens comprising:

a lens body;

position-fixation means having a first portion extending from said lens body and having a second portion remote from said lens body and extending transversely of said first portion for positioning said lens body within an eye; and

a substantially planar layer of material which is soluble in the eye extending from said lens body to said remote portion

of said position-fixation means substantially filling the space therebetween, thereby stiffening said position-fixation means during insertion thereof into the eye.

4,463,458

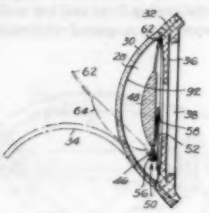
INTRAOCULAR LENS AND IMPLANTATION METHOD

Steven Seidner, Redondo Beach, Calif., assignor to Vision Laboratories Inc., New York, N.Y.

Filed Nov. 8, 1982, Ser. No. 439,998

Int. Cl.³ A61F *1/16, 1/24*

U.S. Cl. 3—13 **7 Claims**



1. A method of implanting an intraocular lens which comprises, making a surgical incision in the eye, inserting at least a portion of an intraocular lens assembly in the anterior chamber of the eye, pre-positioning at least one haptic associated with said lens assembly so that it is located at substantially the final position in said anterior chamber which it will occupy when the optic section of said lens assembly is in a position to function as a replacement for a surgically removed natural lens of the eye or portion thereof, and thereafter surgically removing at least a portion of said natural lens.

4,463,459

ENDO-SKELETAL ARTIFICIAL LIMB

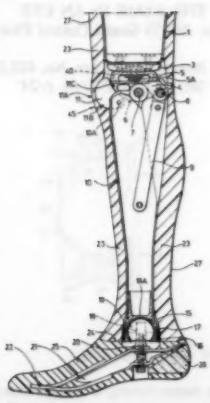
John J. Shorter; Victor J. Woolnough, and Michael W. Brewer, all of Hampshire, England, assignors to Chas. A Blatchford & Sons Limited, Hampshire, England

Filed Sep. 21, 1981, Ser. No. 303,843

Claims priority, application United Kingdom, Sep. 25, 1980, 8031039

Int. Cl.³ A61F *1/08*

U.S. Cl. 3—30 **4 Claims**



1. An artificial leg comprising a shin member, a foot, and a joint therebetween comprising a ball having a rubber covering, fixed to the foot, and a socket enveloping the ball and covering, the socket having upper and lower socket portions which fit around the ball and covering, the upper socket portion being connected to the shin member, a rotatable sleeve-like member surrounding the socket and wherein said rotatable sleeve-like member having spaced, oppositely threaded inner surface portions to engage correspondingly threaded outer surface portions of said upper and lower socket portions, respectively, the upper and lower socket portions being connected together and clamped around the ball and covering by the rotatable sleeve-like member such that rotation in one direction of the rotatable sleeve-like member causes the two socket portions to move towards each other to clamp the ball and covering.

4,463,460

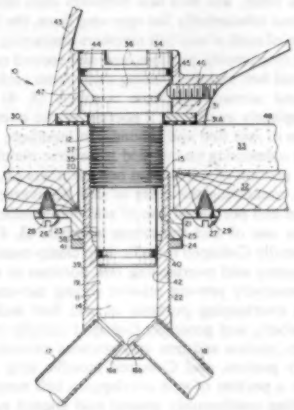
ROMAN TUB FIXTURE

Don C. Arnold, Buffalo Grove, Ill., and Thomas J. Wilcox, East Troy, Wis., assignors to Indiana Brass, Inc., Frankfort, Ind.

Filed Aug. 13, 1982, Ser. No. 407,994

Int. Cl.³ E03C *1/00*

U.S. Cl. 4—191 **12 Claims**



1. A Roman tub fixture assembly for flush mounting a spout to walls or decks having a rough wall and a finished wall of variable thicknesses, comprising:

a receiver body having first and second open ends and a first flow passageway therebetween, the first open end adapted for direct coupling with a plurality of spaced apart water pipes in flow communication with the water pipe through the first flow passageway;

means, exclusive of said plurality of water pipes, for mounting said receiver body to the rough wall and preventing axial, lateral and rotational displacement of the receiver body after such mounting, said mounting means providing for adjustment of the axial position of the receiver body relative to the rough wall during mounting;

a spout hub removably coupled to said receiver body, said spout hub having a shank portion and a shoulder portion and a second flow passageway therethrough, the shank portion being telescopically received within the second open end of said receiver body behind the wall or deck such that said spout hub and said receiver body are in flow communication through the first and second flow passageways; and

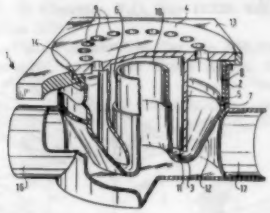
a spout removably coupled to the shoulder portion of said spout hub in flow communication with said water pipes through the first and second flow passageways.

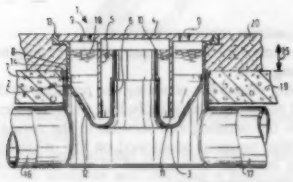
4,463,461

DISCHARGE PIT HAVING A WATER TRAP

Johan R. van den Broeke, and Aleidus G. van den Broeke, both of Nijverdal, Netherlands, assignors to Viplex-Plastics B.V., Nijverdal, Netherlands

Filed Jan. 4, 1983, Ser. No. 455,586
Claims priority, application Netherlands, Jan. 19, 1982, 8200186
Int. Cl.³ E03C *1/26*
U.S. Cl. 4—288 3 Claims





1. A discharge pit having a water trap and adapted to be connected to a discharge pipe, said discharge pit comprising:
a housing adapted to be connected to said discharge pipe;
an annular pot vertically displaceable within said housing and having an outer cylindrical wall, an inner cylindrical wall of lesser height than said outer wall, and a bottom wall connecting said outer and inner walls, one of said outer and inner walls slidably engaging said housing;
a perforated lid removably supported on the upper end of said outer wall and having a tube stub extending vertically within said annular pot; and
a seal carried by said annular pot and engaging said housing.

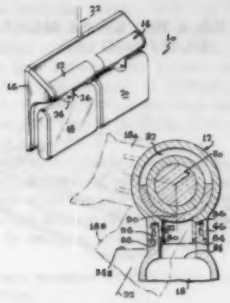
4,463,462

SHOWER DISPENSER CONTAINER-RECEIVER COUPLING SYSTEM

Bart E. Greenhut, Los Angeles, Calif., assignor to L'Aimee Laboratoires, Ltd., Los Angeles, Calif.

Filed Sep. 7, 1982, Ser. No. 415,229
Int. Cl.³ A47K *3/22*
U.S. Cl. 4—605 9 Claims

1. A shower dispenser container-receiver coupling system comprising:
a shower dispenser receiver having walls forming an opening and a thread inside the opening; and
a container having a neck that can be received in the receiver opening, a thread on the neck that mates with the receiver thread, and a cam;
the walls of said receiver that form said opening, forming a resilient detent located in the path of said cam as the container is turned to screw the container thread on the receiver thread, said detent positioned so that as the container is screwed in the detent is first deflected out of the way of the cam and then released to lie behind said cam to resist unscrewing of the container, said receiver walls also forming a stop that prevents substantial further container rotation past the position at which the detent is released.

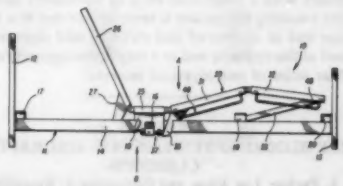


4,463,463

ADJUSTABLE BED

Kenichi Kaneko, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 23, 1981, Ser. No. 246,671
Claims priority, application Japan, Mar. 28, 1980, 55-040589; Apr. 14, 1980, 55-049489; Jun. 4, 1980, 55-075060
Int. Cl.³ A61G *7/06, 7/00*
U.S. Cl. 5—68 10 Claims



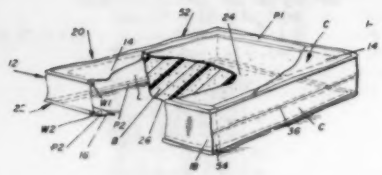
1. An adjustable bed comprising:
a frame;
a stationary board fixedly mounted on said frame;
a movable board mounted on said frame and positioned in a horizontal position with said stationary board in a plane parallel with said frame;
driving means for moving said movable board out of the horizontal plane formed by said stationary board, said driving means comprising a motor, a circuit for controlling said motor, and a drive transmitting mechanism disposed between said motor and said movable board; and
safety means for stopping operation of said motor when a portion of the human body is caught between said frame and said movable board during lowering thereof so as to prevent injury to the body, said safety means comprising switch means included in said circuit for stopping said motor and detecting means for disconnecting said switch means.

4,463,464

SMOLDER-RESISTANT UPHOLSTERY

Gretchen L. Bost, Hickory, N.C., and Hampton O. Powell, Altavista, Va., assignors to The Lane Company, Inc., Altavista, Va.

Filed Feb. 4, 1982, Ser. No. 345,912
Int. Cl.³ A47G 9/02
U.S. Cl. 5—459 10 Claims



1. For upholstering the bat of a boxed cushion, where the upholstery conventionally includes a unitized body of upholstery material including a top wall, a bottom wall, a perimetrical sidewall, an upper perimetrical welt portion enclosing an upper welt cord, and a lower perimetrical welt portion enclosing a lower welt cord,

the upholstery improvement comprising:

a liner of lining material having means imparting a smolder-resistant quality thereto, said liner lining said perimetrical sidewall of said unitized body of upholstery material, both said perimetrical welt portions of said unitized body of upholstery material and only a respective perimetrical marginal portion of about a half inch in width of each of said top wall and said bottom wall of said unitized body of upholstery material;

extending in a perimetrical direction, said sidewall including a zippered interval and a non-zippered interval;

in said zippered interval, two respective strips of said liner having respective medial side margins sewn to respective side margins of a zipper jointly with respective medial side margins of two respective strips of upholstery material; and

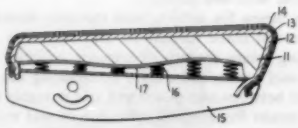
in said non-zippered interval, a strip of said liner being juxtaposed with a respective strip of upholstery material and the resulting composite is sewn at one end to a respective one end of all four of said strips of said zippered interval and at the opposite end to a respective opposite end of said four strips of said zippered interval.

4,463,465

FIRE BLOCKING SYSTEMS FOR AIRCRAFT SEAT CUSHIONS

John A. Parker, Los Altos, and Demetrius A. Kourtides, Gilroy, both of Calif., assignors to The United States of America as represented by the Administrator of National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 23, 1982, Ser. No. 452,466
Int. Cl.³ A47C 27/14; B32B 1/00, 5/22
U.S. Cl. 5—459 22 Claims



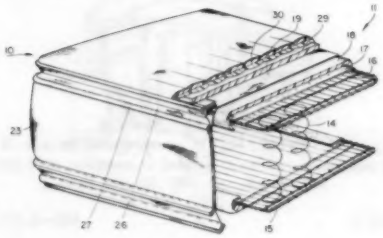
19. A fire resistant cushion comprising an inner core of foamed organic polymer characterized as producing combustible organic vapors when exposed to a temperature above 250° C. covered by a flexible matrix of a material that will, at said temperature, catalyze the vapor phase cracking of said combustible organic vapors to less combustible species.

4,463,466

MATTRESS CONSTRUCTION AND METHOD

George C. May, Greenwood; Robert G. May, and Lawrence T. May, both of Indianapolis, all of Ind., assignors to May and Co., Inc., Indianapolis, Ind.

Filed Nov. 9, 1981, Ser. No. 319,455
Int. Cl.³ A47C 27/05, 27/045
U.S. Cl. 5—475 8 Claims



1. A mattress which comprises:

a base including a spring unit and a padding mounted to the spring unit;

retaining means for retaining the padding to the spring unit, said retaining means including a sheet material positioned over the padding and secured to the spring unit;

a padding material positioned on top of said base, said padding material being glued to the sheet material of said retaining means; and

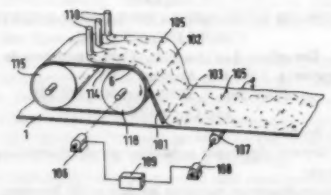
a cover positioned over said padding material, said cover being glued to said padding material and being secured to the sheet material of said retaining means.

4,463,467

METHOD AND APPARATUS FOR APPLYING A PATTERN TO A CONTINUOUSLY ADVANCING WEB OF MATERIAL

Heinz Grüber, Tönisvorst; Johannes Kutz, and Manfred Moser, both of Krefeld, all of Fed. Rep. of Germany, assignors to Eduard Küsters, Krefeld, Fed. Rep. of Germany

Filed Jun. 18, 1982, Ser. No. 389,892
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1981, 3132565; Sep. 1, 1981, 3134569
Int. Cl.³ D06B 1/06
U.S. Cl. 8—151 9 Claims



1. Method for applying a pattern to a continuously advancing web with a treatment medium contained in a foam comprising:

(a) applying the foam to an element revolving about an axis extending transversely to the web;

(b) generating a patterned foam layer on the element;

(c) wiping the foam off the revolving element with a wiper blade and transferring it by the wiper blade to the web of

material which passes underneath without making contact; and

(d) controlling the forward velocity of the web of material and the speed of rotation of the revolving element to obtain a desired pattern effect on the web.

4,463,468
BUMPER FOR AUTOMATIC SWIMMING POOL CLEANING EQUIPMENT

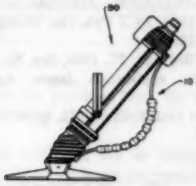
Daniel J. V. D. Chauvier, P.O. Box 11325, Selcourt, Springs, South Africa (1567)

Filed Feb. 24, 1983, Ser. No. 469,424

Claims priority, application South Africa, Mar. 9, 1982, 82/1560

Int. Cl.³ E04H *3/20*

U.S. Cl. 15—1.7 **6 Claims**



1. A bumper assembly for a swimming pool cleaning device, said assembly comprising

a carrier element connectable with said device, said carrier element being elongate and defining a longitudinal axis, and

a plurality of bumper elements rotatably mounted on said carrier element, said bumper elements being rotatable relative to said carrier element's axis upon engagement with an obstruction in a swimming pool.

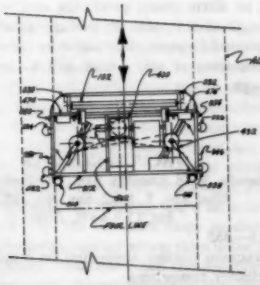
4,463,469
AUTOMATIC BOWLING LANE MAINTENANCE MACHINE

Sheldon R. Green, Township of New Franken, Kewaunee County, Wis., assignor to Lois G. Hickey, Greenleaf, Wis.

Filed Jun. 23, 1982, Ser. No. 391,159

Int. Cl.³ B24B *29/00*

U.S. Cl. 15—98 **8 Claims**



1. An automatic bowling lane maintenance machine for treating the surface of a bowling lane, having gutters at opposite side of the lane, such gutters having ends at the foul line, comprising:

a frame;

means for supporting the frame above the lane for longitudinal movement along the lane, parallel to the gutters;

a plurality of rotatable buffers mounted on such frame so as to make brushing contact with the lane surface, such plurality of buffers being of such width that the width of the brushed area is substantially the full width of the bowling lane between the gutters, such buffers being mounted so that the axes of rotation of the buffers are normal to the lane surface and such axes move longitudinally along the lane as the frame is moved longitudinally along the lane;

the rotatable buffers further comprising pivotally mounted flat blades, the pivotal mounting allowing limited vertical movement of the blades in a plane generally perpendicular to the axis of rotation of the blade to allow the blade when buffing to conform to vertical irregularities in the lane surface

power means mounted on said frame for rotatably driving said buffers;

means for applying lane dressing to the bowling lane in front of the buffers;

drive means for driving said frame in a predetermined course in forward and reverse movement longitudinally along the lane.

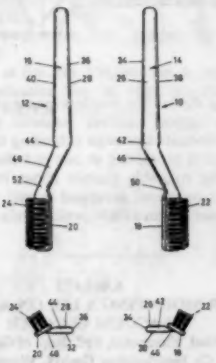
4,463,470
TOOTHBRUSH

Brian D. Willis, Edson, Canada, assignor to Brian D. Willis, P.C., Edson, Canada

Filed Mar. 17, 1983, Ser. No. 476,410

Int. Cl.³ A46B *9/04*

U.S. Cl. 15—167 R **1 Claim**



1. A pair of separate right and left handed toothbrushes wherein each brush comprises;

a handle portion defining front and rear surfaces, and inner and outer side edges, and a transverse plane and a free, unencumbered end;

a neck portion extending from the other end of said handle portion;

a brush head portion formed on said neck portion, and having a transverse plane;

a first bend formed between such handle and such neck, said first bend portion being formed in said transverse plane, whereby said neck portion is angled outwardly with respect to said outer edge of said handle;

an axial twist in said neck between said first bend portion and said head, whereby said head portion is rotated to lie in a plane disposed angularly outwardly;

a second bend between said neck portion and said head, said second bend lying in the transverse plane of said head, whereby the axis of said head is aligned parallel to the axis of said handle, and wherein said toothbrush is formed with

said first bend angled to the right and said second bend to the left, and wherein the other said toothbrush is formed with the first bend angled to the left and the second bend to the right, and wherein said one toothbrush has an axial twist to the right, and wherein said other toothbrush has an axial twist to the left, whereby said one toothbrush may be used, in the right hand for cleaning the following surfaces: right mandibular occlusal, right mandibular buccal, right maxillary buccal, left mandibular lingual and the upper incisors, and whereby the other said toothbrush may be used in the right hand for cleaning the following tooth surfaces: left mandibular occlusal, left mandibular buccal, left maxillary palatal, right maxillary occlusal right maxillary buccal, right mandibular lingual and the lower incisors, said brushes being used separately and independently of one another.

4,463,471

WIPING DEVICE FOR WINDOW PANES OF A MOTOR VEHICLE

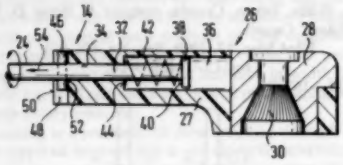
Günter Zorn, Buehl, Fed. Rep. of Germany, assignor to Robert Bosch Gmbh, Stuttgart, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,266

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1982, 3221391

Int. Cl.³ B60S *1/32*

U.S. Cl. 15—250.19 **17 Claims**



1. A wiping device for window panes of a motor vehicle, comprising a support member rotatable about an axis and including an elongated passage extending transversely to said axis; a wiper arm projecting at one end thereof into said passage and being rotatable therein about its center axis; and releasable locking means arranged in said passage for releasably locking said arm in a fixed position relative to said support member.

4,463,472

DEVICE FOR MOUNTING A LID ON A HOUSING OF A VACUUM CLEANER

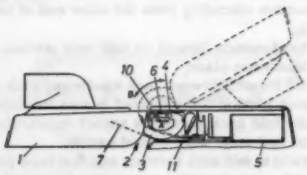
Paul-Ulrich Uibel, Ennepetal, Fed. Rep. of Germany, assignor to Vorwerk & Co Interholding GmbH, Wuppertal, Fed. Rep. of Germany

Filed Aug. 30, 1982, Ser. No. 412,853

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 8137759[U]

Int. Cl.³ A47L *5/36*

U.S. Cl. 15—327 F **2 Claims**



1. A device for connecting a lid for closing a dust filter space of a vacuum cleaner to a housing of the vacuum cleaner, comprising two curved arms spaced from each other in a direction transversal to the elongation of the housing of the vacuum cleaner and rigidly connected to the lid, said housing being formed with two oblong openings, said curved arms each carrying a pivot axle positioned in each of said oblong openings so that each pivot axle can slide within the respective opening between one end position and another end position, said curved arms being pivotable about the pivot axles when the pivot axles are in the one end position so as to permit said lid to pivot relative to said housing between an open position and a closed position in the range of about 150°.

4,463,473

VACUUM CLEANER

Seiichi Nakada; Hiromi Yoshikawa, both of Yokaichi; Hiroshi Ohno, Otu; Tsuneo Nishijima, and Hiroshi Kawakami, both of Yokaichi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

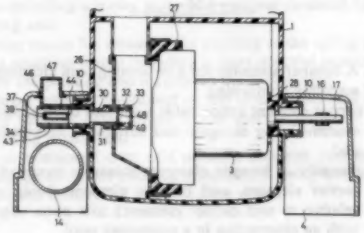
PCT No. PCT/JP81/00090, 371 Date Dec. 23, 1981, 102(e) Date Dec. 23, 1981, PCT Pub. No. WO81/02971, PCT Pub. Date Oct. 29, 1981

PCT Filed Apr. 17, 1981, Ser. No. 333,787

Claims priority, application Japan, Apr. 23, 1980, 55-56372[U]

Int. Cl.³ A47L *9/19*

U.S. Cl. 15—339 **8 Claims**



1. In a vacuum cleaner: a filter, a fan motor having a suction region disposed downstream of said filter, bypass air passage means vented directly to atmosphere and connected to communicate with said suction region of the fan motor in bypassing relation to said filter, and a pressure-responsive valve for opening or closing said bypass air passage means in response to change in pressure in said suction region past a predetermined value, said change in pressure being caused by dust collected within the vacuum cleaner, said bypass air passage means including an alarm sound producing unit actuated by an air flow through said bypass air passage means and a closure device mounted for manual actuation by the user to selectively prevent actuation of said sound unit by restricting airflow therethrough.

4,463,474

VACUUM CLEANER

Paul G. Jacobs, 9958 Amestay Ave., Northridge, Calif. 91324

Filed Jun. 7, 1982, Ser. No. 385,493

Int. Cl.³ A47L *7/00*

U.S. Cl. 15—353 **16 Claims**

13. A vacuum cleaner supported on a movable base, said vacuum cleaner comprising:

an open-faced recovery tank for receiving soiled material to be retained in said vacuum cleaner, said tank being releasablY mounted in the movable base;

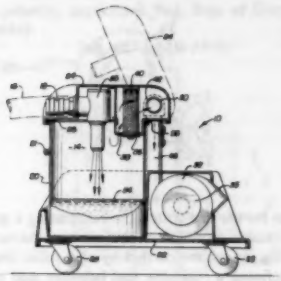
means for closing said tank and thereby forming a vacuum chamber therein;

a fan mounted on the movable base, said fan having an air inlet and an air outlet;

a first passage through said closing means for permitting soiled material to pass into said vacuum chamber;

a second passage through said closing means placing said inlet of said fan in communication with said vacuum chamber;

a hollow hinge providing a point of attachment for said



closing means to the movable base, the interior of said hollow hinge forming a portion of said second passage; and

means for filtering soil from the air exiting said closing means, said filtering means being interposed in said second passage between said vacuum chamber and said hollow hinge.

4,463,475

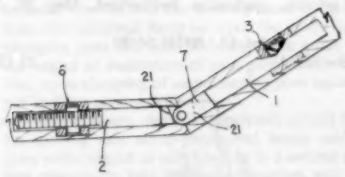
JOINT LOCKING MECHANISM

Robert Rivers, 1114 Linden Ave., Sharon Hill, Pa. 19079

Continuation-in-part of Ser. No. 084,720, Oct. 15, 1979. This application May 11, 1982, Ser. No. 377,067

Int. Cl.³ E05D *7/06*

U.S. Cl. 16—241 **8 Claims**



1. An improved hinge lock mechanism for joining two or more panels together at any angle comprising at least two arms joined together at an angle wherein one arm has means for securing it into one panel and another arm has an exaggerated conical V shaped depression thereon that communicates with a clamp-tightening means for securing the another arm into a second panel, the clamp-tightening means comprising a housing with anchoring fins thereon, a horizontal passageway through the housing which the another arm passes, a perpendicular threaded channel in the housing, and a set screw with a conical shaped end that has the same slope as that of the conical V shaped depression, said set screw rides in the perpendicular threaded channel, wherein when the another arm is secured in the second panel, the perpendicular threaded channel in the housing of the clamp-tightening means is aligned over an outer slope of the conical V shaped depression of the another arm and the set screw is tightened against the outer slope of the another arm urging the another arm away from the one arm so that the two panels are tightened and locked together creating a tight and continuous seam.

4,463,476

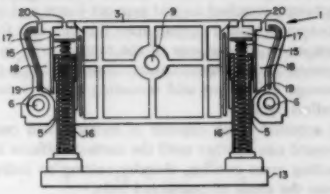
MEAT TENDERIZER

Andre R. Jaccard, Holland, N.Y., assignor to Jaccard Corporation, Orchard Park, N.Y.

Filed Apr. 4, 1983, Ser. No. 481,893

Int. Cl.³ A22C *9/00*

U.S. Cl. 17—30 **20 Claims**



1. A meat tenderizer comprising a handle means, a blade assembly means, a tube connecting means, and a stripping plate means, said handle means comprising an external and an internal open liquid flow channel network adapted to permit liquid to drain from all internal hollow handle means cavities out of said handle means, said blade assembly comprising at least one blade segment and adapted to resiliently move toward and away from said handle means, said tube connecting means movably connecting said handle means and said stripping plate, said stripping plate adapted to permit at least one blade segment to pass therethrough.

4,463,477

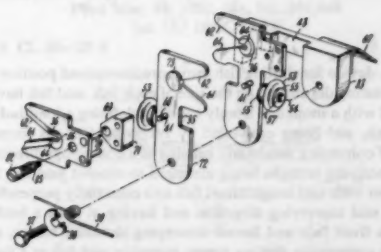
APPARATUS FOR SEPARATING STUFFED SAUSAGE LINKS

Francis J. Ziolko, Bridgewater, N.J., assignor to Devro, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 279,895, Jul. 2, 1981, Pat. No. 4,418,447. This application Nov. 10, 1982, Ser. No. 440,645

Int. Cl.³ A22C *11/00*

U.S. Cl. 17—34 **5 Claims**



1. Apparatus for separating individual sausage links from a chain of connected sausage links comprising:

a support frame;

a mounting means attached to the support frame and capable of moving in an endless cycle;

means to move said mounting means;

a plurality of support brackets affixed at spaced points on said mounting means;

a pair of cutting arms attached to each of said support brackets;

each of said cutting arms having at the end of said arm an opening which faces toward the opening in the other cutting arm of the same pair;

the first cutting arm of said pair comprising two cutting elements spaced from each other,

the second cutting arm of said pair having an anvil which is

capable of tightly fitting in the space between the cutting elements in the first cutting arm to cut the twisted casing between adjacent links;

means to direct a string of connecting sausage links into the space formed by the opening in a pair of cutting arms;

a follower attached to at least one of the cutting arms in each pair;

an actuator attached to said support frame and operatively connected to said cutting arms through said followers to first move at least one of the cutting arms in each pair toward one another to contact connected ends of adjacent sausage links when said mounting means is moved in an endless cycle;

said actuator being capable of moving said cutting arms toward one another until the cutting surfaces in a pair of cutting arms overlap, thereby cutting an individual link from the chain of connected links.

4,463,478

DEVICE FOR SHIFTING FISH INTO POSITION FOR DECAPITATING

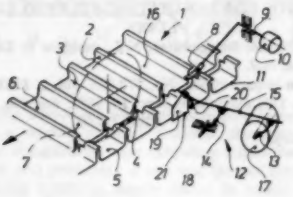
Franz Hartmann, Bad Oldesloe, and Gottfried Heinen, Neversdorf, both of Fed. Rep. of Germany, assignors to Nordischer Maschinenbau Rud. Baader GmbH & Co KG, Lubeck, Fed. Rep. of Germany

Filed Jun. 23, 1982, Ser. No. 391,129

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1981, 3125412

Int. Cl.³ A22C *25/14*

U.S. Cl. 17—63 **6 Claims**



1. A device for shifting fish into a predetermined position for decapitating depending on the size of each fish, said fish having a head with a snout and a body together defining a longitudinal fish axis, and being conveyed by receiving troughs forming part of conveying means and running in a conveying direction, said receiving troughs being arranged to receive said fish in a position with said longitudinal fish axis essentially perpendicular to said conveying direction and having at least a bottom wall, a front face and lateral conveying shoulder means, said device comprising shifting means engaging said fish in a timed manner according to the conveying rate of said troughs and defining a shifting path, feeler means adapted to be displaced by said fish for detecting a value of the size of said fish, and means coupled with said feeler means for limiting the length of said shifting path according to the detected value of the size of said fish, wherein said device further comprises

a. a shifting element driven by said shifting means and having an operational face engaging said fish by its snout to shift it in a backward direction into said predetermined position, said shifting element being moved along said shifting path in such a direction and at such a rate as to accompany the fish in its conveyed movement at least during the shifting thereof,

b. stepping motor means for driving said shifting means, and

c. control device means for controlling said stepping motor means by processing signals produced through and received from said feeler means.

4,463,479

GRIT SEAL FOR COTTON GIN ROLLER BAR

James E. Nayfa, 10310 Woodford Dr., Dallas, Tex. 75229

Filed Mar. 26, 1982, Ser. No. 361,607

Int. Cl.³ D01B *1/08*

U.S. Cl. 19—48 A **5 Claims**

1. Apparatus for use in a cotton gin comprising a gin bar and a roller disc rotatably mounted on said gin bar, characterized in that cooperating means are carried by said roller disc and by said gin bar defining a rotatable seal between said roller disc and said gin bar, said cooperating means including an annular rib carried by said roller disc, and said gin bar having an annular groove, said annular rib being received for rotation in said annular groove without touching said gin bar, wherein said annular rib is provided with an inner sidewall and an outer sidewall, said outer sidewall being beveled along an acute slope relative to the rotational axis of said roller disc, thereby defining an annular lint trap chamber.

4,463,480

APPARATUS AND METHOD FOR CHANGING CANS ON A SPINNING PREPARATORY MACHINE

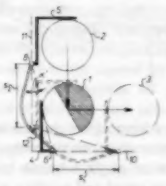
Peter Oehy, Winterthur, and René Schmid, Niederneunforn, both of, Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed May 27, 1982, Ser. No. 382,687

Claims priority, application Switzerland, May 29, 1981, 3513/81

Int. Cl.³ B65H *54/80*

U.S. Cl. 19—159 A **12 Claims**



1. An apparatus for changing cans on a spinning preparatory machine, said apparatus comprising

a pair of shiftable support members, each having an arm movably mounted thereon between an extended position for engaging a can and a retracted position spaced from the can;

a pair of straight guide elements disposed at right angles to each other, each said guide element receiving a respective support member for shifting of said respective support member thereon;

a shifting means interconnecting said support members to each other in a force-transmitting manner; and

a drive means connected to at least one of said support members for reciprocating said members on said respective guide elements.

4,463,481

CLAMPING DEVICE

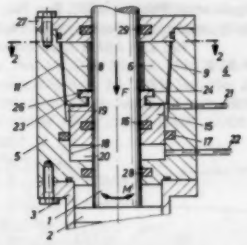
Adolf Rastetter, and Erich Schmalenbach, both of Karlsruhe, Fed. Rep. of Germany, assignors to Sitema, Gesellschaft für Sicherheitstechnik and Maschinenbau mbH, Karlsruhe, Fed. Rep. of Germany

Filed May 4, 1982, Ser. No. 374,861

Claims priority, application Fed. Rep. of Germany, May 9, 1981, 3118449

Int. Cl.³ A44B *21/00*

U.S. Cl. 188—67 **12 Claims**



1. A device for clamping an axially displaceable load-bearing rod, said device comprising:

a housing positioned with the rod extending therethrough, said housing having therein a plurality of planar guide tracks inclined relative to the axis of the rod;

a plurality of clamping jaws spaced around the rod, each said clamping jaw being displaceable within said housing along a respective said guide track;

a single annular servo-piston positioned within said housing surrrounding the rod and directly operating said clamping jaws;

first means operable for moving said servo-piston and hence said clamping jaws in a first axial direction with respect to said housing such that said clamping jaws are drawn along their respective said inclined guide tracks toward the rod into clamping engagement therewith, the frictional force between the rod and the bearing faces of said clamping jaws, the frictional force between the guide faces of said clamping jaws and their said respective guide tracks and the angles of inclination of said guide tracks being such that, upon clamping of said clamping jaws against the rod, self-locking occurs; and

servo second means, operable separately of said first means, for moving said servo-piston and hence said clamping jaws with respect to said housing in a second axial direction opposite to said first axial direction, and thereby to release said clamping jaws from the rod.

4,463,482

FASTENER

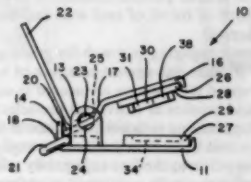
Robert L. Hawie, Stratford, Conn., assignor to The Hawie Mfg. Co., Bridgeport, Conn.

Filed Sep. 22, 1982, Ser. No. 421,031

Int. Cl.³ A44B *21/00*

U.S. Cl. 24—489 **6 Claims**

1. A releasable compression fastener having a pair of jaws designed to be clamped over a layer of flexible fabric inserted within the opening of said jaws comprising a base plate having an upper surface forming one said jaw, a flexible clamping plate pivotally-attached to said base plate and having an under-surface forming the other jaw of said pair, and an actuating cam member pivotally-attached to said base plate over said clamping plate and movable between a closed position in which it contacts and flexes said clamping plate against said base plate to close said pair of jaws, and an open position in which it releases contact with said clamping plate to permit said clamping plate to flex out of contact with said base plate to open said pair of jaws, characterized by one of said jaws comprising a male member having a flat surface supporting a male projection having at least two extensions which extend in directions away from each other and from the opening of said jaws and which taper together towards said opening to form a crotch, said male projection and extensions having a raised surface of uniform height above said flat surface, the other of said jaws comprising a female member having a flat surface and a recess in said flat surface, said recess being in alignment with and having a shape corresponding to said male projection and being slightly larger in width than said male projection to permit said male projection to depress a clamped area of flexible fabric within said recess when said fastener is in closed position, whereby a layer of flexible fabric clamped between said jaws is clamped between said flat surfaces of said male and female members and a portion thereof is clamped within said recess by said male projection, any slippage of the clamped fabric from between said flat surfaces in the direction of the opening of said jaws causing the fabric movement to be directed by the converging extensions of said male member and to accumulate at the crotch thereof in the form of a bulk of said fabric incapable of further slippage, whereby any strain on the clamped fabric is distributed over a broad area of the fabric.



4,463,483

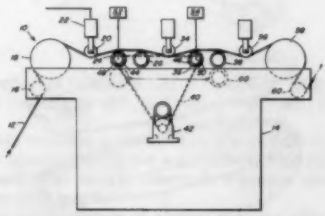
FABRIC NAPPING APPARATUS

William J. Holm, Nashua, N.H., assignor to W. H. Company, Inc., Ayer, Mass.

Filed Mar. 11, 1982, Ser. No. 356,948

Int. Cl.³ D06C *11/00*

U.S. Cl. 26—29 P **8 Claims**



1. Apparatus for napping the face of a running fabric web, comprising

(a) at least one pair of cylindrical rotatable worker brushes mounted in spaced parallel relation to one another adjacent the path of travel of said web and extending transversely thereof;

(b) guide means engaging said web for guiding said web in a generally straight line against said pair of brushes;

(c) variable speed drive means connected to said brushes for rotating the leading brush in a direction counter to the pile direction of said web and rotating the trailing brush in the same direction as said pile;

(d) individually controlled separate clutch means between said drive means and each of said brushes for indepen-

dently controlling the power transmitted to each of said brushes; and

(e) a rotary cylindrical stripping brush mounted parallel to said worker brushes for movement in a plane parallel to the plane of said worker brushes in a direction parallel to the reach of said web between said worker brushes, said stripper brush adapted to contact said worker brushes on a side opposite the side in contact with said web, and means for moving said stripper brush from one worker brush to another.

6. Apparatus for napping the face of a running fabric web, comprising

(a) at least one pair of cylindrical rotatable worker brushes mounted in spaced parallel relation to one another adjacent the path of travel of said web and extending transversely thereof;

(b) guide means engaging said web for guiding said web in a generally straight line against said pair of brushes;

(c) variable speed drive means connected to said brushes for rotating said brushes at individual pre-selected speeds;

(d) a pair of application rolls both mounted in spaced parallel relation to said brushes in position to engage the face of said web opposite to the face engaged by said brushes, one of said application rolls positioned in advance of the leading brush and one of said application rolls positioned after the trailing brush; and

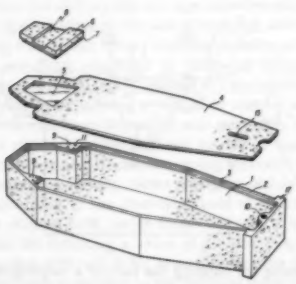
(e) a rotary cylindrical stripping brush mounted parallel to said worker brushes for movement in a plane parallel to the plane of said worker brushes in a direction parallel to the reach of said web between said worker brushes, said stripper brush adapted to contact said worker brushes on a side opposite the side in contact with said web, and means for moving said stripper brush from one worker brush to another.

4,463,484

COFFIN, VAULT AND MAUSOLEUM MODULE COMBINATION

Fernando Valle Arizpe, 4a Calleo 47, Zona 10, Guatemala City, Guatemala

Filed Sep. 15, 1982, Ser. No. 417,431
Claims priority, application Guatemala, Feb. 17, 1982, 73910
Int. Cl.³ A61G *17/00*
U.S. Cl. 27—2 **5 Claims**



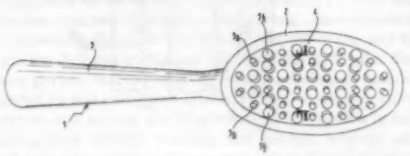
1. A coffin, vault, and mausoleum module combination comprising a generally coffin shaped structure having bottom, wall, and top lid structure, portions of the wall being free and uncovered by the lid structure and reinforced to be particularly resistant to compressive forces in the vertical direction, the bottom having depending tongue structure and the lid structure having groove structure for receiving the tongue structure of the module above when the modules are stacked, the lid structure comprising a cover with a window and a longitudinal groove said longitudinal groove being greater in length in the longitudinal direction of the cover than in the direction perpendicular thereto, a second cover for closing the window said second cover having a horizontal groove which extends perpendicular to the longitudinal groove, the depending tongue structure fitting in to the said horizontal groove and lying above the reinforced side portions, said bottom including further depending tongue structure in the longitudinal direction for fitting into the said longitudinal groove.

4,463,485

DEVICE FOR DEEP MASSAGE OF THE SKIN

Jean-Louis H. Gueret, Paris, France, assignor to L'Oreal, Paris, France

Continuation of Ser. No. 139,814, Apr. 14, 1980, abandoned.
This application Feb. 16, 1982, Ser. No. 349,403
Claims priority, application France, Apr. 19, 1979, 79 09897
Int. Cl.³ A61H *7/00*
U.S. Cl. 128—62 R **11 Claims**



1. An applicator for massaging the cutaneous covering or skin of a living body,

said applicator being adapted when pressed against and moved laterally and rectilinearly over said cutaneous cover-skin to be capable of effecting and producing a wave-like, undulating and rippling motion in the skin undergoing massage under the influence of the applicator which is favorable to the inducement of beneficial hyperaemia in said skin,

said applicator comprising:

an applicator body having at least one active side;

said active side having an at least substantially, relatively plate-like configuration;

said applicator body being provided on each active side thereof with

diverse protudent sets of digitate stumps thereon arranged in respective and relative interdispersed disposition in and as first and second sets thereof in such arrangement;

the said first and second sets of stumps being made of a flexible, elastically-deformable material and projecting from said at least one active side of said applicator body; with

the stumps of said first and second sets all having:

substantially the same configuration with, in said configuration;

convexly-terminating free tip ends; with

the said tip ends being so formed and shaped as to be free from and conspicuous in their absence of having any cup-like, suction-producing termination constructions thereof and thereon; and

as a further distinguishing construction (thereabout) of said tip ends, being also so formed as to have at least substantially the same heigt of each above the said active side on which they are provided;

but with different width dimensions such that the stumps of said first set have a smaller cross-section than the stumps of said second set so that the thinner-width first-set stumps have relatively-higher flexibility and bendability thereabout as compared to the relatively-lower flexibility and bendability of the thicker-width stumps of said second set;

with the sets of stumps also being so arranged that the stumps of said first and second sets are in a regularly-alternating configuration across said at least one active face on which they are provided; such that

said protrudent first and second stump sets are set in a pattern as shown in FIG. 1; and

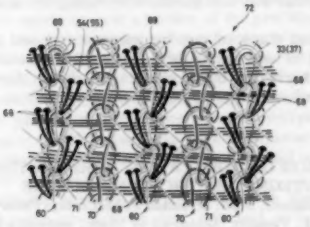
the said stumps arrangement and alignments thereof on each active face of said applicator on which they are provided is adapted upon contacting-passage of the applicator over skin in any given direction of such movement to create a slight depression on the surface of the latter due to the diverse flexibility characteristics of said respective first and second set stumps which depression assumes the shape of said wave-like, undulating and rippling motion in the skin undergoing massage by means of said applicator.

4,463,486

METHOD OF MANUFACTURING A VELVET-TYPE FASTENER WEB

Yoshio Matsuda, Nyuzen, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Division of Ser. No. 147,760, May 8, 1980, Pat. No. 4,338,800. This application Aug. 12, 1981, Ser. No. 292,340
Claims priority, application Japan, May 9, 1979, 54-56789
Int. Cl.³ A44B *21/00*; D06C *13/08*
U.S. Cl. 28—161 **5 Claims**



1. A method of manufacturing a pair of velvet-type fastener webs, comprising the steps of:

(a) knitting a double-faced fabric including a pair of front and back ground structures and a plurality of thermoplastic monofilaments knitted with and having portions extending between said front and back ground structures, said thermoplastic monofilaments being knitted as chain stitches in both said front and said back ground structures, each monofilament having a series of loops knitted in each one of at least selected wales of the respective ground structure;

(b) severing said portion of the monofilaments to separate said double-faced fabric structure into the front and back ground structures each having a plurality of raised thermoplastic stems; and

(c) heating said raised stems to form locking ends thereon.

4,463,487

METHOD OF MANUFACTURING PISTON RINGS

Lodovico Raggi, Milan, Italy, assignor to Associated Engineering Italy S.p.A., Turin, Italy

Filed Apr. 30, 1981, Ser. No. 259,188
Int. Cl.³ B23P *15/06*
U.S. Cl. 29—156.63 **7 Claims**

1. A method of manufacture of a piston ring, including the following steps:

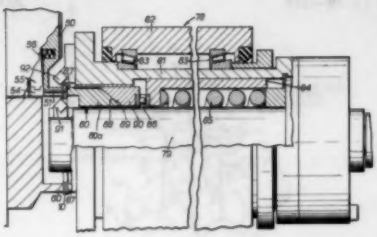
making a ring blank of which the diameter over the outer periphery is greater, and the diameter within the inner periphery is less than that required in the finished ring and of which the side faces are parallel;

drilling two holes in the ring blank;

engaging two substantially parallel pins set at a predetermined spacing in the drilled holes to locate the ring blank in a condition in which the ring blank is unstressed by external forces;

cutting a gap in the ring blank either before or after the drilling step to afford two free ends, the positions of the holes being such that each hole is adjacent an associated free end;

reducing the spacing of the pins to hold the ring blank in a closed position;



clamping the so held ring blank in a closed position between said side faces while the ring blank is on the pins, said ring blank being clamped so as to expose the entire inner and outer peripheries of the ring blank; and then

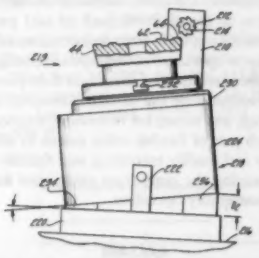
machining the inner and outer peripheries of the ring blank to be circular.

4,463,488

INDEXING WORK TABLE

Daniel J. Pieczulewski, South Lyon, Mich., assignor to A. G. Davis Gage & Engineering Co., Hazel Park, Mich.

Filed Mar. 17, 1981, Ser. No. 244,589
Int. Cl.³ B23P *15/14*
U.S. Cl. 29—159.2 **19 Claims**



1. A method of forming a pair of concentric rings of face teeth on a coupling member, said method comprising the steps of:

adjustably mounting a sine block on a work table by center pivot means such that the angle between said sine block and said work table is selectively adjustable about said center pivot means;

fastening a first member of a rotary indexing table to said sine block, said rotary indexing table further comprising a second member rotatably interconnected with said first member;

securing said coupling member to said second member of said rotary indexing table;

setting a first predetermined angle of said sine block relative to said work table to fix a first coning angle from the central axis of said coupling member;

cutting a first ring of said pair of concentric rings of face teeth on said coupling member;

adjusting said sine block to a second predetermined angle to fix a second coning angle from the central axis of said coupling member; and

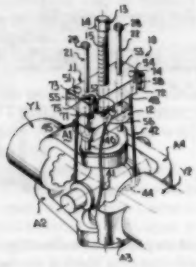
cutting a second ring of said pair of concentric rings of face teeth on said coupling member.

4,463,489

UNIVERSAL JOINT PULLER

William G. James, 855 Rte. 113, Harleysville, Pa. 19438

Filed Jan. 28, 1983, Ser. No. 461,758
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—259 **20 Claims**



1. A universal joint puller for disassembling a universal joint including its cross and bearing cups from drive shaft and/or transmission shaft yokes comprising first and second relatively movable members adapted to be moved between a first relatively adjacent position and a second relatively spaced position, means for applying a force between said first and second member to move the same from said first position to said second position incident to removing a bearing cup from an arm of an associated universal joint cross, thread means for connecting said puller to threaded bores of an associated drive shaft or transmission shaft yoke, a pair of flexible cable means for entraining arms of the cross normal to the arm from which a bearing cup is to be removed, each of said pair of flexible cable means having opposite ends connected to said first member whereby upon operation of said force applying means, said movable members are moved from said first position toward said second position with the resultant removal of an associated bearing cup, and means for removably connecting at least one end of each pair of flexible cable means to said first member for rapidly and readily entraining said flexible cable means about and removing the same from cross arms during an universal joint disassembly operation.

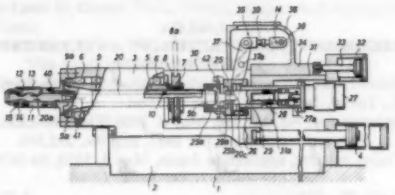
4,463,490

COMPOSITE BORING AND HONING MACHINE AND METHOD OF MAKING THE SAME

Yoshikuni Saito, Tokyo; Hitoshi Hashimoto; Isao Arai, both of Saitama, and Minoru Wada, Sayama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP80/00103, 371 Date Oct. 19, 1981, 102(e) Date Oct. 19, 1981, PCT Pub. No. WO81/02404, PCT Pub. Date Sep. 3, 1981
PCT Filed May 14, 1980, Ser. No. 314,069
Claims priority, application Japan, Feb. 26, 1980, 55-23181
Int. Cl.³ B23P *13/00;* **B24B** *33/08*
U.S. Cl. 29—566.1 **9 Claims**

1. A boring and honing machine, comprising:
a slide base;
a spindle case slidably supported on said slide base;
a spindle rotatably supported in said spindle case;
said spindle being hollow and provided with splines on the inner surface thereof, and having a tapered opening defined at one end thereof;
a bar member fitted in said hollow spindle;
said bar member being provided with splines engaging with said splines of said spindle such that said bar member is axially slidable relative to said spindle and integrally rotatable with said spindle;
said bar member being provided with a tapered shank defined adjacent one end thereof;
a tool head mounted on said tapered shank of said bar member, said tool head having boring tools and honing stones disposed coaxially thereon;
drive means for rotating said spindle;
first reciprocating means for reciprocating said bar member relative to said spindle when honing a workpiece;



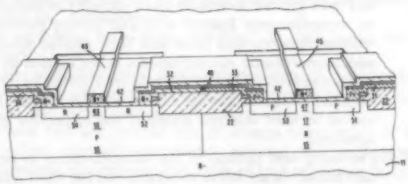
second reciprocating means for reciprocating said bar member together with said spindle when boring the workpiece; and
said tapered shank of said bar member and said tapered opening of said spindle being engaged with each other during boring of the workpiece and being disengaged from each other during honing of the workpiece.

4,463,491

METHOD OF FABRICATING A MONOLITHIC INTEGRATED CIRCUIT STRUCTURE

Ernest A. Goldman, Stow; Jeremiah P. McCarthy, Framingham, and Paul E. Poppert, Acton, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 23, 1982, Ser. No. 371,325
Int. Cl.³ H01L *21/82, 21/88, 21/225*
U.S. Cl. 29—571 **4 Claims**



1. The method of fabricating monolithic integrated circuit structure incorporating complementary field effect transistors comprising
providing a body of semiconductor material having a first section of one conductivity type and a second section of the opposite conductivity type at a surface of the body with a first sector within said first section and a second sector within said second section covered by an adherent coating of insulating material, the portions of the surface of the body contiguous with said first and second sectors being covered by an adherent field layer of insulating material thicker than the coating of insulating material;
removing portions of said coating of insulating material to form openings exposing first and second spaced apart zones in said first sector and first and second spaced apart zones in said second sector;
forming adherent contact members of semiconductor material of the one conductivity type of low resistivity on the surfaces of the exposed first and second zones in said second sector extending over portions of said adherent coating and field layer of insulating material, and forming adherent contact members of semiconductor material of the opposite conductivity type of low resistivity on the

surfaces of the exposed first and second zones in said first sector extending over portions of said adherent coating and field layer of insulating material, one of the contact members of semiconductor material of the one conductivity type being contiguous with one of the contact members of semiconductor material of the opposite conductivity type at a junction;

forming an adherent layer of highy conductive material on and in ohmic contact with the one contact member of semiconductor material of the one conductivity type and on and in ohmic contact with the one contact member of semiconductor material of the opposite conductivity type in the regions of the contact members in which they are contiguous, thereby shorting out the rectifying junction therebetween;

removing the coating of insulating material from said first and second sectors except the portions thereof underlying said adherent contact members of semiconductor material to expose portions of said first and second sectors;

placing an adherent gate layer of insulating material on the exposed portions of said first and second sectors;

placing a first gate member of semiconductor material of low resistivity over a portion of the gate layer of insulating material overlying a channel region of said first sector with said channel region lying between two source/drain regions of said first sector, and a second gate member of semiconductor material of low resistivity over a portion of the gate layer of insulating material overlying a channel region of said second sector with said channel region lying between two source/drain regions of said second sector; and

introducing conductivity type imparting material of the opposite conductivity type into said two source/drain regions of said first sector including said first and second zones in said first sector, and introducing conductivity type imparting material of the one conductivity type into said two source/drain regions of said second sector including said first and second zones in said second sector.

4,463,492

METHOD OF FORMING A SEMICONDUCTOR DEVICE ON INSULATING SUBSTRATE BY SELECTIVE AMORPHOSIZATION FOLLOWED BY SIMULTANEOUS ACTIVATION AND RECONVERSION TO SINGLE CRYSTAL STATE

Kenji Maeguchi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 24, 1982, Ser. No. 423,146

Claims priority, application Japan, Sep. 30, 1981, 56-155185

Int. Cl.³ H01L *21/263, 21/225*

U.S. Cl. 29—576 B **13 Claims**

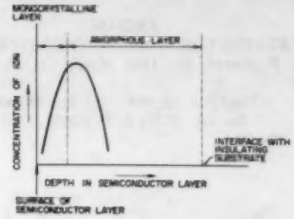
1. A method for manufacturing a semiconductor device, comprising the steps of:

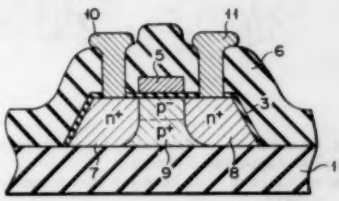
forming a monocrystalline semiconductor layer on an insulating substrate;

implanting ions for breaking the regularity of the crystal lattice of said monocrystalline semiconductor layer into said monocrystalline semiconductor layer to form an amorphous layer in part of said monocrystalline semiconductor layer along a direction of thickness thereof;

doping an impurity in said amorphous layer and a remaining portion of said monocrystalline semiconductor layer; and

annealing the structure thus obtained, whereby activation of said first impurity and recrystallization of said amorphous layer by solid phase growth using said remaining portion





of said monocrystalline semiconductor layer as a seed crystal are simultaneously performed.

4,463,493

METHOD FOR MAKING MASK ALIGNED NARROW ISOLATION GROOVES FOR A SEMICONDUCTOR DEVICE

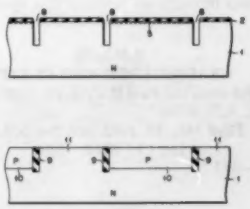
Hiroshi Momose, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 24, 1982, Ser. No. 423,300

Claims priority, application Japan, Oct. 14, 1981, 56-162813

Int. Cl.³ H01L *21/22, 21/316*

U.S. Cl. 29—576 B **13 Claims**



1. A method of making mask aligned narrow isolation grooves for a semiconductor device having an insulating layer filled in the groove of a semiconductor substrate to form an island region surrounded by the insulating layer, the method comprising the steps of:

forming a mask pattern on a major surface of the semiconductor substrate in such a manner that side wall of the mask is at a taper angle of 90° or less with respect to the major surface of the semiconductor substrate;

ion-implanting an impurity of a conductivity type opposite to that of the semiconductor substrate into the semiconductor substrate using the mask pattern;

forming a narrow groove in a portion of said semiconductor substrate adjacent to the side wall of the mask pattern;

filling said groove with insulating material to form a narrow insulating layer; and

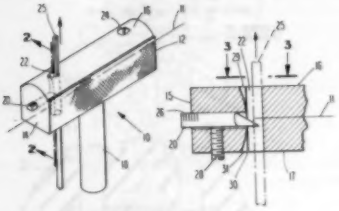
diffusing the implanted impurity to form an island region surrounded by said insulating material.

4,463,494

APPARATUS FOR SHAPING PRECIOUS METALS

Anthony F. Bianco, Jr., 1101 Morris St., Philadelphia, Pa. 19148

Filed Feb. 10, 1982, Ser. No. 347,438
Int. Cl.[3] B23D 9/00; B26B 27/00
U.S. Cl. 30—90.4 9 Claims



1. An apparatus for forming a groove in a length of jewelry metal, said apparatus comprising:

a. an elongated body having at least upper, lower and end surfaces;

b. at least one vertical first opening through said body between said upper and lower surfaces and perpendicular to an axis extending through said body along its largest dimension;

c. said first opening having a larger cross-sectional opening at said upper surface than at a location whereat said axis extends through said body;

d. a second opening extending into said body and substantially perpendicular to said first opening;

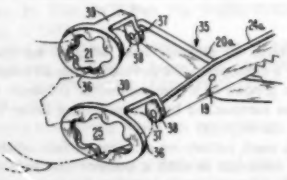
e. a metal grooving tool positioned in said body such that it is secured within and extending through said second opening wherein the groove cutting portion of said tool extends into said first opening a desired distance to intersect the movement of jewelry metal through said first opening and for removing a track of jewelry metal and forming a desired depth groove in said length of jewelry metal as it progresses through said vertical first opening.

4,463,495

CRAB HOLDER AND CUTTER

Jerrilyn J. Johnson, and Paul B. Johnson, both of P.O. Box 623, Siler City, N.C. 27344

Filed May 18, 1982, Ser. No. 379,288
Int. Cl.[3] B26B 11/00
U.S. Cl. 30—142 1 Claim



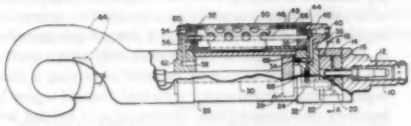
1. A set of dining table implements for eating crab or the like, comprising, in combination, a holder for holding down steadily a crustaceous shell, and a cutter for cutting the same open, and means for storage of said holder on said cutter; said holder comprising a toothed head at one end of a handle; and said cutter comprising a pair of crossing levers pivoted together, each lever having a handle at one end and a blade at an opposite end for cooperation together, one said blade being toothed; and a finger or thumb-receiving member pivotally attached on an end of each said handle, each said member comprising a ring having a scallop-edged opening for receiving a thumb or finger therethrough, an L-shaped stem integral with said ring extending at right angles to a flat plane of said ring, a pivoting rivet through a terminal leg of said stem being mounted on a side of said handle, said scalloped opening being axially aligned with said rivet, and said stem of one said member being longer than the stem of the other said member whereby the rings are differently spaced from said handles and the parallel flat planes of said rings are offset relative to each other.

4,463,496

DEEP SUBMERGENCE VEHICLE (DSV) LIGHTWEIGHT CABLE CUTTER

Ronald S. Reich; Jimmy L. Held; Arthur E. Munson, and James R. Hartley, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 1, 1982, Ser. No. 438,239
Int. Cl.[3] B26B 17/04; B63C 11/52
U.S. Cl. 30—180 9 Claims



1. An improved cable cutter for use on an underwater vehicle of the type having a cutting blade which is forcibly driven against an anvil for cutting cables, wherein the improvement:

means for containing a hydraulic fluid in a manner that it is physically separated from a surrounding underwater environment;

means which is hydraulically actuated for forcing the cutting blade against and away from the anvil, said means having a moving connection with the cutting blade;

means including a shaft connected to the containing means and the forcing means for actuating the forcing means by pumping the hydraulic fluid through the forcing means in one direction or the other, said one direction forcing the cutting blade against the anvil and said other direction forcing the cutting blade away from the anvil;

means for connecting the shaft of the actuating means to the underwater vehicle; and

means connected with the containing means for compensating the pressure and volume of the hydraulic fluid with the hydrostatic pressure of the surrounding underwater environment.

4,463,497

OFFSET SNIPS

James R. O'Keeffe, Hastings, Nebr., assignor to Prosnip Corporation, Dewitt, Nebr.

Filed Jun. 7, 1982, Ser. No. 386,049
Int. Cl.[3] B26B 13/26
U.S. Cl. 30—252 21 Claims

1. Offset snips for cutting sheet material, comprising:

a first blade member having a substantially flat first pivot boss and a first cutting surface offset with respect to the plane of the first pivot boss;

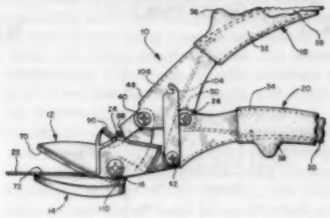
a second blade member having a substantially flat boss and a second cutting surface offset with respect to the plane of the second pivot boss;

pivot means pivotably connecting the first and second blade members for rotation about an axis perpendicular to and through the first and second pivot bosses;

means for pivoting the first and second blade members about

pivot means such that the first and second cutting surfaces are movable between an open position and a closed position for cutting sheet material therebetween;

said first pivot boss and the first cutting surface being adapted for removal of material therefrom so as to provide a resharpened cutting surface while maintaining the offset



therebetween, and said second pivot boss and the second cutting surface being adapted for removal of material therefrom so as to provide a resharpened cutting surface while maintaining the offset therebetween, the first and second pivot bosses serving as reference surfaces to facilitate resharpening of the offset snips; and

means for cutting wire by pinch cutting.

4,463,498

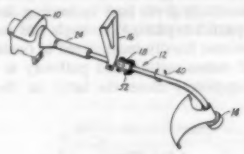
COUPLING FOR FLAILING LINE TRIMMER HANDLES

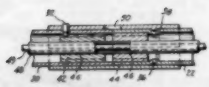
Robert G. Everts, 2050 N. 90th Pl., Chandler, Ariz. 85224

Filed Aug. 31, 1982, Ser. No. 413,521

Int. Cl.³ A01G *3/06*

U.S. Cl. 30—296 R **9 Claims**





1. In a trimmer of the flailing line type having a handle, a handle shaft, a drive head at the distal end of said handle shaft, an engine, and means operatively joining said engine to said drive head, the improvement comprising:

releasable clamp means joining said handle to said drive head whereby said drive head may be rotated and held at a predetermined tilt angle with respect to said handle,

said clamp means comprising a first handle shaft part and a second handle shaft part,

said drive head being attached to the end of one of said handle shaft parts,

releasable coupling means for coupling said first and second handle shaft parts,

said coupling means comprising a split clamp surrounding and securely clamping the ends of said first and second handle shaft parts in abutment with each other,

one of said handle shaft parts having a circumferential groove on its end positioned within said coupling means, and

said split clamp having a lip on its inside surface in engagement with said groove whereby said one of said handle shaft parts may rotate within said clamp independently of the other and be restrained against axial removal.

4,463,499

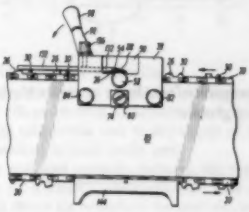
PORTABLE CHAIN SAW SHARPENING KIT WITH DEPTH GAUGE FILING ATTACHMENT

Thomas A. Fritz, 8104 Larch La., Vanderburgh County, Evansville, Ind. 47710

Division of Ser. No. 308,105, Oct. 2, 1981, Pat. No. 4,404,872. This application May 26, 1983, Ser. No. 498,555

Int. Cl.³ B23D *59/00*

U.S. Cl. 30—382 **2 Claims**



1. A protective hand slide for engaging the bar of a chain saw in order to allow the saw chain thereon to be manually advanced, said hand slide comprising an elongated handle member adapted to be placed against the edge of a chain saw bar, said handle member having a longitudinal channel therein for receiving the saw chain and a transversely-mounted pin within said channel for engaging a cutting link of the saw chain.

4,463,500

WELDING-WIRE FEED MONITOR

Herbert Rampf, Unterschleissheim, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Aug. 10, 1982, Ser. No. 406,875

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1981, 3132240

Int. Cl.³ G01B *3/12*

U.S. Cl. 33—129 **8 Claims**

2. A device for monitoring the movement of an electrode wire, comprising:

a housing;

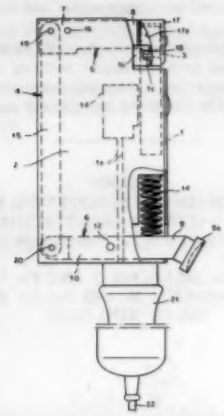
a measuring roller journaled in said housing for rotaiton about a roller axis and adapted to indicate displacement of an electrode wire pressed against said roller;

a guide fixed in said housing and disposed along at least one side of said roller and having a groove open outwardly to receive a wire in contact with said roller;

a pressing roller in said housing for pressing said wire against said measuring roller, said housing being formed with a lever having an end swingable between an open and closed position about an axis perpendicular to said roller axis; and

a jaw on said end of said lever blocking escape of said wire from said groove and juxtaposed with said guide in said

closed position, said pressing roller being mounted on said jaw and being swung away from said measuring roller



upon operation of said lever to unblock escape of said wire from said groove.

4,463,501

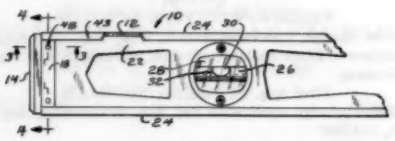
LEVEL CONSTRUCTION AND METHODS OF CONSTRUCTING A LEVEL

Randall J. Wright, Brookfield, and Gary T. Macklin, Oconomowoc, both of Wis., assignors to Empire Level Mfg. Corp., Milwaukee, Wis.

Continuation-in-part of Ser. No. 342,599, Jan. 25, 1982, abandoned, which is a continuation of Ser. No. 109,758, Jan. 7, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 430,790

Int. Cl.³ G01C *9/08, 17/18*

U.S. Cl. 33—350 **7 Claims**



3. A level instrument comprising an elongated frame having a working surface defining a plane; a vial secured to the frame and disposed in a preselected angular relationship with the plane of the working surface; an end of the frame having indexing means thereon aligned in a predetermined angular relationship with respect to the plane of the working surface and the vial; a plastic end plate formed with coacting indexing means mateable with the indexing means on the frame wherein end plate edges are spaced from the coacting indexing means and including a lip disposed adjacent the coacting indexing means and overlying a portion of the frame wherein the frame portion which the lip overlies includes a passage and the lip includes an integral stake element which is inserted into the passage to anchor the end plate to the frame in automatic orientation obviating intersection of any edge of the plastic end plate with the plane of the working surface.

4,463,502

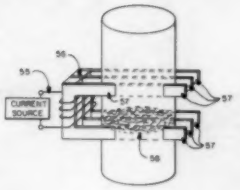
MAGNETIC DISTRIBUTOR-DOWNCOMER FOR FLUIDIZED BEDS AND MAGNETIC VALVE TO CONTROL THE FLOW OF SOLIDS

Thomas J. Fitzgerald, 3121 St. Albans Dr., Los Alamitos, Calif. 90720, and Octave Levenspiel, 1634 NW. Crest Pl., Corvallis, Oreg. 97330

Filed Mar. 8, 1982, Ser. No. 355,955

Int. Cl.³ F26B *3/08*

U.S. Cl. 34—1 **31 Claims**



1. A magnetically operated valve arrangement for turning on and off the flow of solid particles including at least a certain minimum amount of magnetizable particles, said valve arrangement comprising:

(a) means defining a confined pathway through which all of said particles are adapted to flow from an upstream point when said valve arrangement is maintained in an opened operating condition;

(b) fixed structural means extending into said pathway without preventing said particles from flowing therethrough when said valve arrangement is in its opened operating condition; and

(c) means including said structural means cooperating with said pathway for closing the latter to the passage of upstream particles at any given time by causing downstream magnetizable particles passing through the pathway at that time to become fixedly magnetized to one another at said structural means within said pathway in sufficient quantity to completely close the latter to the flow of solids.

4,463,503

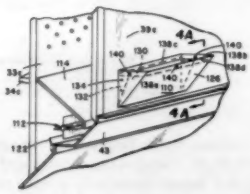
GRAIN DRIER AND METHOD OF DRYING GRAIN

Robert D. Applegate, Attica, Ind., assignor to Driall, Inc., Attica, Ind.

Division of Ser. No. 306,666, Sep. 29, 1981, Pat. No. 4,411,620. This application Jun. 29, 1983, Ser. No. 509,181

Int. Cl.³ F26B *17/12;* **F27D** *1/08*

U.S. Cl. 34—172 **6 Claims**



1. In a grain drier which includes a grain path defined by means including a pair of spaced apart, generally vertically disposed, horizontally-extending forminous members between which grain moves downwardly while air is passed through it to promote drying and further includes a metering assembly disposed in said grain path for controlling the flow of grain through said grain path, the improvement comprising:

a plurality of horizontally spaced apart openings formed in said grain path defining means to form a passageway between the grain path and the exterior of the grain drier,

each of said openings being disposed at a position in the grain path immediately above, upstream from, and adjacent to the metering means and each of said openings having a lower edge, an upper edge and side edges; and

a plurality of dump closures for selectively covering and uncovering said openings, said dump closures and openings being operable to dump the grain from the grain path through said openings before the grain reaches the metering assembly when said dump closures uncover said openings; each of said dump closures comprising:

at least one dump panel disposed and dimensioned to substantially cover one of said openings to prevent grain from flowing therethrough, said dump panel having at least upper and lower edges;

mounting means for releasably mounting said dump panel in a position covering one of said openings with the lower edge of said dump panel being disposed adjacent to the lower edge of said opening and with the upper edge of said dump panel being disposed at a position above the upper edge of said opening so that said dump panel when held by said mounting means prevents grain from flowing from the grain path out of said openings;

release attachment means for releasably attaching said dump panel to said mounting means, and for selectively releasing said dump panel from said mounting means; and

said dump panel being operable when released from said mounting means to move away from said openings and allow grain to dump from the grain path.

4,463,504

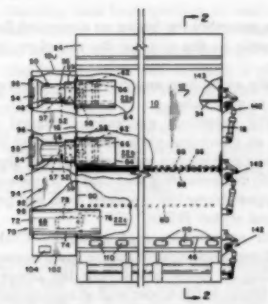
GRAIN DRIER AND METHOD OF DRYING GRAIN

Robert D. Applegate, Attica, Ind., assignor to Driall, Inc., Attica, Ind.

Division of Ser. No. 306,666, Sep. 29, 1981, Pat. No. 4,411,620. This application Jun. 29, 1983, Ser. No. 509,182

Int. Cl.³ F26B *17/12;* **F23M** *7/00;* **F24D** *23/02*

U.S. Cl. 34—175 **6 Claims**



1. An improvement in a grain dryer having a passageway defined by imperforate walls and foraminous walls and a fan disposed for moving air from outside said passageway into said passageway and into said foraminous walls, comprising:

an opening formed in said passageway and being disposed remotely from said fan for selectively allowing air and foreign material to be blown out of the passageway through said opening;

a plate mounted inside the passageway for selectively covering said opening;

means for supporting said plate adjacent said opening; and

actuation means attached to said plate for effecting movement of said plate between a closed position immediately adjacent to and covering said opening and an open position disposed inwardly from said opening inside the passageway to selectively cover and uncover said opening whereby air movement produced by said fan blows foreign material off of said walls and out of said opening.

4,463,505

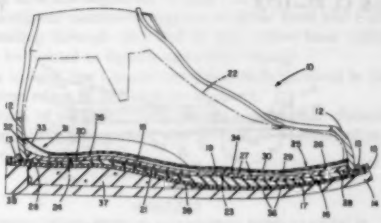
SOLE

Gary P. Duclos, Southbridge, Mass., assignor to Joseph M. Herman Shoe Co., Inc., Cambridge, Mass.

Filed Sep. 27, 1982, Ser. No. 423,631

Int. Cl.³ A43B *13/12, 13/00;* **A61F** *5/14*

U.S. Cl. 36—30 R **16 Claims**



1. In a sole for footwear comprising:

an insole unit having an axially extending surface and a peripheral rib projecting downwardly from said surface for stitching said insole unit to the upper of the footwear,

a midsole attached to said insole unit,

said insole unit and midsole defining the top and bottom surfaces of a cavity therebetween, said cavity being bounded about its periphery by said rib, and

an outsole attached to said midsole,

the improvement comprising an orthotic element mounted in said cavity, said orthotic element comprising

an axially extending flexible support layer,

a metatarsal support comprising a raised area in said flexible support layer, said raised area being anatomically shaped to conform to the entire metatarsal area of the foot, and

a heel cradle comprising a depressed area in said support layer, said depressed area being anatomically shaped to conform to the heel of the foot.

4,463,506

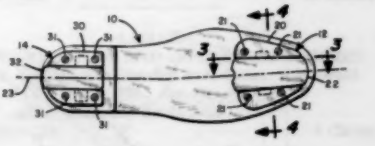
TAPS FOR DANCING

Dale F. Isackson, Box 93, West Star Rte., Two Harbors, Minn. 55616

Filed Dec. 20, 1982, Ser. No. 451,245

Int. Cl.³ A43B *3/00*

U.S. Cl. 36—113 **10 Claims**



7. An attachment for fastening to a shoe along the length axis of the shoe, comprising

(a) a first attachment piece adapted for fastening to said shoe, said piece having two halves in mirror image construction adapted for fastening about the length axis of said shoe, each of said halves having a raised edge portion generally parallel to said axis, and having a recessed bridging portion generally normal to said axis at a first position, and having a groove in said edge portion generally normal to said axis at a second position, said groove being cut into an opposite surface from said recess of said recessed bridging portion; and

(b) an insert piece aligned along said axis between said raised edge portions, said insert piece having projecting ears positioned for seating in said grooves and having a forward end for seating in said recess of said recessed bridging portion.

4,463,507

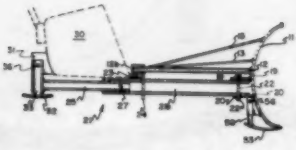
GRADER BLADE ATTACHMENT

Arnold A. Gaub, Box 18, Alpine, Wyo.

Filed Apr. 12, 1982, Ser. No. 367,275

Int. Cl.³ E02F *3/76*

U.S. Cl. 37—117.5 **14 Claims**



1. A grader blade attachment for a bucket vehicle comprising

a scraper blade;

a support arm pivotally connected to the rear of the blade centrally thereof and extending rearwardly thereof to provide a sliding surface for a bucket;

a pivot arm having one end fixed to the rear of the blade centrally thereof; means guiding the other end of the immovably pivot arm to swing laterally while preventing vertical movement thereof during pivoting of the blade with respect to the pivot connection of the support arm to the blade;

channel means for receiving a lower leading edge of a bucket sliding on the support arm and coupling the leading edge of the bucket to the support arm;

means to couple the support arm to the rear of the bucket; and

means to lock the angle of the blade with respect to the support arm.

4,463,508

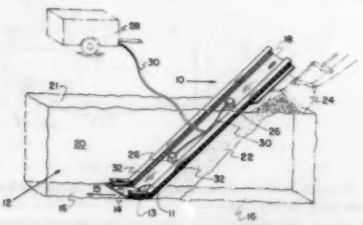
BACKFILL COMPACTOR

Paul Maxian, P.O. Box 280, Ringoes, N.J. 08551, and Joseph Maxian, P.O. Box 507, Yardley, Pa. 19067

Filed Feb. 9, 1983, Ser. No. 465,278

Int. Cl.³ E02F *5/22*

U.S. Cl. 37—142.5 **7 Claims**



1. A device to tamp aggregate in a trench or the like earth furrow as the device progressively moves in a forward direction comprising:

(a) a rigid, generally rectangular ramp of a width predetermined to fit within a trench at an inclined rearward direction said ramp having an upwardly facing surface and a downwardly facing surface and two sides which, in use, juxtapose with walls of said trench and two ramp ends, one end of a length predetermined to allow it to protrude from said trench, said upwardly protruding end serving as a guide for backloading of aggregate against the downwardly facing surface of said ramp,

(b) a rigid, angular foot having a top surface and a bottom surface and attached to said ramp's other end at an obtuse angle in respect to the upwardly facing surface of said ramp, said foot extending from said ramp in the direction of forward progress so as to rest it bottom surface on saidtrench floor; and,

(c) means for causing vibration of said ramp so that when said ramp rests against aggregate placed behind and under said ramp in said trench, said trench, said aggregate vibrates and compacts to fill a predetermined depth and width of a trench in one continuous operation.

4,463,509

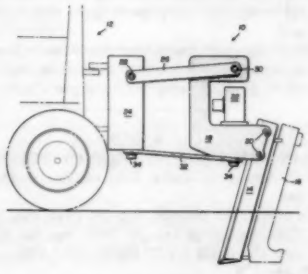
VIBRATORY PLOW ASSEMBLY

Emil T. Leonard, Wichita, Kans., assignor to J.I. Case Company, Racine, Wis.

Filed Mar. 11, 1983, Ser. No. 474,393

Int. Cl.³ E02F *5/18*

U.S. Cl. 37—193 **2 Claims**



1. A plow assembly for laying an elongated flexible element such as a cable in the slot cut by the plow in the ground, comprising:

a vertically extending support frame adapted to be connected to a vehicle,

a vertically extending generally C-shaped shaker frame having an elongated plow blade attached thereto and an oscillating mechanism supported on said shaker frame for vertically reciprocating said shaker frame and plow blade, said support frame being spaced from and generally parallel to said shaker frame,

means for suspending said generally C-shaped shaker frame from said support frame, said suspending means consisting of links connecting the upper end of said shaker frame to the upper end of said support frame with each link being pivotally attached at one end to said shaker frame and pivotally attached at its opposite end to said support frame, said suspending means further consisting of a generally planar, horizontally disposed, spring plate member which interconnects the lower end of said shaker frame to the lower end of said support frame, and

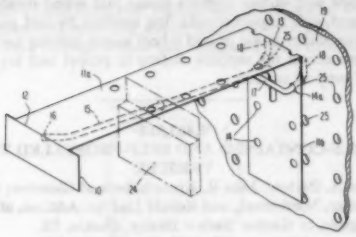
said spring plate member being fixedly attached at one end to the bottom of said support frame and being secured at its other end to the bottom of said generally C-shaped shaker frame whereby said support frame restrains one end of said spring plate member during vertical vibratory movement of said shaker frame on the opposite end of said plate member such that the vibrational movement imparted to said shaker frame by said oscillating mechanism being transmitted to said spring plate member for reinforcing or prolonging the vibratory movement imparted to said plow blade.

4,463,510

SPACE SAVING VARIABLE LENGTH TAG DISPLAY DEVICE

Richard J. Windish, 10 Whitehall Dr. R.D. #1, Chadds Ford, Pa. 19317

Continuation of Ser. No. 233,625, Feb. 12, 1981, abandoned.
This application Jul. 25, 1983, Ser. No. 516,769
Int. Cl.³ B65D *73/00*; A47F *7/00*
U.S. Cl. 40—124.4 5 Claims



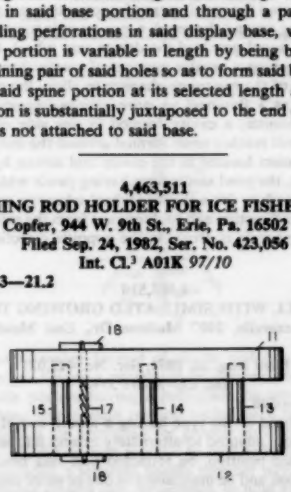
1. A system for displaying merchandise comprising:
a perforated display base;
generally elongated hook means having an end insertable into said display base;
a display device formed from a unitary piece of sheet material and comprising:
a tag portion;
an elongated variable length spine portion with pairs of holes disposed at predetermined intervals along its length, said tag portion being foldably connected to one end of said spine portion;
a back portion foldably connected to the other end of said spine portion, said pairs of holes of said spine portion continuing at predetermined intervals along the length of said back portion; and
means for attaching said back portion to said display base wherein said device is attached to said display base by passing said hook attaching means through a pair of said holes in said base portion and through a pair of corresponding perforations in said display base, wherein said spine portion is variable in length by being bent across a remaining pair of said holes so as to form said back portion and said spine portion at its selected length and said tag portion is substantially juxtaposed to the end of said hook means not attached to said base.

4,463,511

FISHING ROD HOLDER FOR ICE FISHERMEN

Robert T. Copfer, 944 W. 9th St., Erie, Pa. 16502

Filed Sep. 24, 1982, Ser. No. 423,056
Int. Cl.³ A01K *97/10*
U.S. Cl. 43—21.2 3 Claims



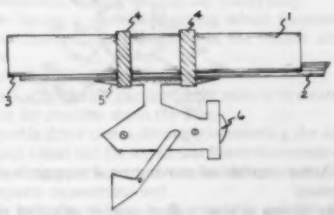
1. A rod holder for use in fishing or the like comprising a base,
said base comprising spaced support members adapted to rest on the supporting surface,
means on said support member to receive a pivot means on a fishing rod,
a resilient member extending between said support members and spaced from said pivot means,
said support member being adapted to receive a pivot member attached to a fish rod and extending laterally therefrom and received therebetween with the handle of said rod resting on said resilient member,
whereby said rod jiggles up and down when a fish strikes a hook on a line supported on said rod,
said elongated member comprises a rubber band and a pin extending through each end of said rubber band which can be twisted to tighten said rubber band,
means to hold the support comprises nails received in the bottom edges of said support members,
the heads of said nails being spaced a substantial distance from said bottom surface and adapted to be disposed in a support.

4,463,512

DIRECT CONNECTED SPINNING ROD HANDLE

William G. McCreery, 122 Caldwell Dr., Hendersonville, Tenn. 37075

Filed Aug. 2, 1982, Ser. No. 404,535
Int. Cl.³ A01K *87/06*
U.S. Cl. 43—22 5 Claims



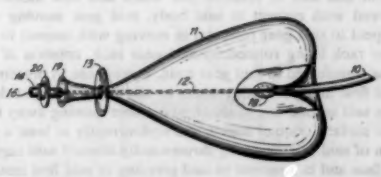
1. A fishing rod handle in combination with a rod member, comprising, said fishing rod handle having an external surface, a groove formed in said external surface of said handle and extending longitudinally for at least a partial distance along said external surface, said rod member being adapted for placement into said groove, and means for securing said rod member to said fishing rod handle, wherein the user's hand will be in contact with the rod member while holding said handle.

4,463,513

SHAPING BALLOONS AND INFLATABLE SPHERES

Cornelius J. Wallace, 839 Clarence Ave., Bronx, N.Y. 10465

Filed Sep. 2, 1982, Ser. No. 414,416
Int. Cl.³ A63H *3/06*
U.S. Cl. 446—222 4 Claims



1. A balloon comprising:
elastically expansible balloon means having an opening for introducing a gas to inflate said balloon means;

first anchor means wrapped at least partially by an external portion of said balloon means;

valve means secured to said balloon means at said opening, said valve means having a first end extending outwardly from said balloon means and a second end extending inwardly within said balloon means, said valve means having a circumferential wall defining a first through aperture for introducing gas to inflate said balloon means and a second aperture in said circumferential wall at said second end;

elongated guide means extending entirely within said balloon means and having a first end for securing said external portion of said balloon means to said first anchor means and a second end secured to said valve means at said second aperture.

4,463,514

TOY HAVING PIVOTING MEMBERS

Yoshitoshi Nagai, Tokyo, Japan, assignor to Tomy Kogyo Company, Inc., Japan

Filed Jul. 15, 1982, Ser. No. 398,685

Claims priority, application Japan, Aug. 26, 1981, 56-126362[U]

Int. Cl.³ A63H *13/02*

U.S. Cl. 446—294 **11 Claims**

1. A toy capable of moving on a support surface which comprises:

a body having at least a first member attached thereto, said body including a surface contact means, said first member having ends, said first member pivotally mounted about the first of its ends to said body about a pivot means centered on an axis of rotation;

an arcuate gear rack fixedly mounted to said body about said axis of rotation;

a spring means having ends, one of said ends attaching to said body and the other of said ends attaching to said first member;

a wheel means located on the other of said ends of said first member;

a gear train means included on said first member, said gear train means including a gear located on said first member in association with said axis of rotation so as to engage said gear rack, said gear train operatively connected to said wheel means for rotating said wheel means;

said first member moving with respect to said body by pivoting about said axis of rotation and when said first member is moved with respect to said body, said gear moving with respect to said gear rack and in moving with respect to said gear rack being rotated by said gear rack, rotation of said gear transferred to said gear train, in response to pivoting of said first member with respect to said body in a first direction said second end of said first member moving away from said surface contact means and concurrently at least a portion of said body moving downwardly toward said support surface and in response to said pivoting of said first member with respect to said body in the opposite direction said second end of said first member moving toward said surface contact means and concurrently at least a portion of said body moving upwardly away from said support surface;

said toy supported on said support surface by said surface contact means and said wheel means;

said spring means being activated upon moving said first member in said direction wherein said second end of said first member moves away from said surface contact means and when so activated said spring means capable of moving said first member with respect to said body such that said second end of said first member moves back toward said surface contact means and concurrently as said second end moves toward said surface contact means said wheel means being rotated with respect to said first member by said gear train means, said rotation of said wheel means moving said wheel means across the support surface to propel said toy across said support surface.

4,463,515

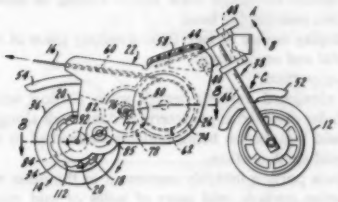
SELF-CONTAINED AND SELF-PROPELLED TOY VEHICLE

Gordon A. Barlow; John R. Krutsch, both of Glenview; Marvin Smollar, Northbrook, and Ronald Liedtke, Addison, all of Ill., assignors to Gordon Barlow Design, Skokie, Ill.

Filed Apr. 27, 1982, Ser. No. 372,329

Int. Cl.³ A63H *5/00*

U.S. Cl. 446—409 **11 Claims**



1. A simplified compact toy motorcycle including: a frame, a front wheel and a driven rear wheel mounted on the frame, a rev-up mechanism for imparting energy to the rear driven wheel including a string spool having a gear, a pull string windable around the spool, means for retracting and rewinding the pull string around the spool, a step up gear train interposed between the spool gear and the driven rear wheel, the driven rear wheel having a greater moment of inertia than the other components of the rev-up mechanism to allow the rear wheel to function as a flywheel to store energy imparted by the rev-up mechanism, a cavity formed in one side of the rear wheel, internal ratchet teeth formed around the cavity, and a pawl mechanism located in the cavity and driven by the step up gear train, the pawl mechanism having pawls which engage the ratchet teeth to drive the rear wheel when the gear train is driven in one direction and to disengage from the ratchet teeth when the gear train is driven in the opposite direction.

4,463,516

TOY DOLL WITH SIMULATED GROWING TOOTH

Mildred Mazzarella, 2407 Madison Dr., East Meadow, N.Y. 11554

Filed Aug. 26, 1982, Ser. No. 412,021

Int. Cl.³ A63H *3/48*

U.S. Cl. 446—320 **3 Claims**

1. A doll head of the type having a mouth and at least one simulated tooth adapted to alternately extend into said mouth in an extended position, be retracted into said head in a retracted position and be maintained in one or more intermediate positions therebetween, said head including mechanical growth means for causing said simulated tooth to alternately assume said extended, retracted and intermedate positions and comprising an elongated shaft which extends into the mouth at one end and out of the top at the opposite end of said doll head

through a key-hole shaped opening with a circular and a rectangular portion, said elongated shaft having at least one simulated tooth at said one end, control means at said opposite end, a detent on one side of said shaft in relatively close proximity to said control means adapted to only be able to pass through said key-hole shaped opening when said detent is aligned with the rectangular position of said opening and be denied passage when the detent is aligned with the circular portion of said opening and a plurality of intermediate locking detent on the same side of said elongated shaft as said detent, and at least one brace internally mounted within said doll head and including an aperture through which said elongated shaft extends and a

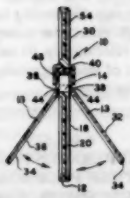
locking mechanism adapted to engage one or more of said intermediate detents in order to retain said elongated shaft and said simulated tooth in one or more intermediate positions, wherein said control means are adapted to cause said simulated tooth to progressively extend from a retracted position through one or more intermediate positions to an extended position by causing the elongated shaft to rotate such that the detent is in alignment with the rectangular position of the key-hole opening to permit passage therethrough and then to sequentially progress through the intermediate positions to the extended position by downward depression of the control means.

4,463,517

NOISEMAKER DEVICE

Douglas S. Kerr, and Gerald A. Lowe, both of Ashland, Ohio, assignors to The National Latex Products Company, Ashland, Ohio

Filed Dec. 20, 1982, Ser. No. 450,925
Int. Cl.³ G10D *13/08*
U.S. Cl. 446—421 **14 Claims**



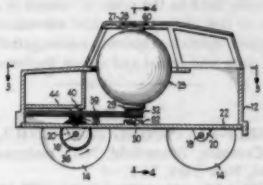
1. A noise maker formed of plastic material comprising a body portion having a projection on one end thereof, at least one paddle portion having a projection on one end thereof, said at least one paddle portion including a flexible plastic hinge adapted for providing for pivotal movement of said at least one paddle portion relative to said body portion and to said projections, a separate handle member having a recessed end receiving therein said projections, to hold said portions in generally adjacent relation, means for locking said handle member to said body portion and said at least one paddle portion, said at least one paddle portion being adapted to pivot into and out of impacting relation to said body portion upon shaking of said noisemaker by said handle member, to create a rythmic-like noise, and wherein said projection on said body portion comprises spaced peripheral laterally projecting shoulders defining therebetween a recessed slot portion in said body portion projection, receiving therein said projection on said at least one paddle portion, said locking means comprising lug means on said shoulders received in complementary openings in said handle member for interlocking the handle member to said body portion and at least one paddle portion.

4,463,518

COMBINATION VEHICLE AND TOP TOY

Robert E. Smathers, Los Angeles, Calif.; John R. Wildman, North Riverside, and Burton C. Meyer, Downers Grove, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Oct. 7, 1982, Ser. No. 433,228
Int. Cl.³ A63H *29/20, 1/00*
U.S. Cl. 446—237 **8 Claims**



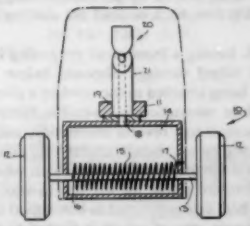
1. A combination vehicle and top toy comprising:
a vehicle having a surface engaging wheel mounted for rotation during linear movement of the vehicle along a surface;
a top including an axis of rotation;
the top being releasably carried by the vehicle in a rotatable position for rotation about the axis;
disengageable drive means drivingly connecting the surface engaging wheel and the top so that linear movement of the vehicle along a surface by an external force rotates the top and imparts momentum; and
means for retaining the top in the rotatable position during continued rotation of the wheel and permitting the rotating top to disengage itself from the drive means and eject itself from the vehicle when the rotating wheel drive means are abruptly stopped.

4,463,519

REVERSIBLE DIRECTION DRIVE MECHANISM FOR TOY VEHICLES

Thomas J. Hayes, New York, N.Y., assignor to Buddy L Corporation, New York, N.Y.

Filed Mar. 23, 1982, Ser. No. 360,915
Int. Cl.³ A63H *17/40*
U.S. Cl. 446—443 **7 Claims**



1. In a toy vehicle including a body, a plurality of wheels rotatably mounted on said body, at least two of said wheels being traction wheels for propelling the vehicle in a predetermined direction and being mounted on horizontal axle means

and adapted for rotation therewith, an improved drive means for said traction wheels, comprising,

spring means coupled to said axle means,

housing means disposed about and surrounding at least part of said axle means and said spring means, said housing means being mounted on said vehicle body so that said body is rotatable with respect thereto about an axis perpendicular to the longitudinal axis of said axle means,

one end of said spring means being coupled to said housing means and the other end of said spring means being coupled to said axle means,

said spring means being wound during initial movement by a user until said vehicle body comes momentarily to rest, said spring means thereafter propelling said vehicle body on a return movement in a direction back to the user, said vehicle body rotating about said housing means during said return movement so that said vehicle body returns substantially back to the point of release in an orientation opposite to that during said initial movement by the user, said housing means maintaining a substantially fixed orientation during said initial and return movements.

4,463,520

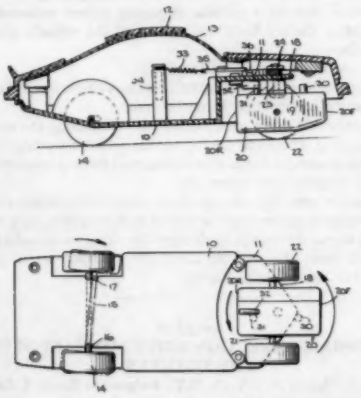
SELF-RETURNING TOY VEHICLE

Dorland L. Crosman, Bloomfield, N.J., assignor to Buddy L Corporation, New York, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,354

Int. Cl.³ A63H *17/40*

U.S. Cl. 446—443 **7 Claims**



1. A four-wheeled toy vehicle when propelled forward by a player from a starting point along a flat surface in the forward direction acts to store energy, the vehicle at the end of its forward run being caused by the stored energy to reverse its orientation as it runs back toward the starting point, said toy comprising:

A. a chassis having a front cowl projecting therefrom;

B. a front wheel carriage disposed below the cowl, the carriage being coupled to the cowl by a pivot pin whereby the carriage orientation is reversible relative to the cowl from a normal to a reverse orientation, said carriage having a spring motor therein operatively coupled to a front wheel axle for the front wheels which when rotated during the forward run of the toy acts to wind up the motor;

C. a rear wheel axle supported in bearings at the rear section of the chassis, one of which is slotted to permit angular displacement of the axle, whereby at the end of the forward run, the energized motor then acts to drive the front wheel carriage in the reverse direction to cause angular displacement of the rear axle, as a result of which the chassis swings in an arc to assume a position behind the front wheel carriage as it returns toward the starting point.

4,463,521

DEVICE FOR DEPOSITING A TREATMENT LIQUID, SUCH AS A WEEDKILLER, ONTO PLANTS

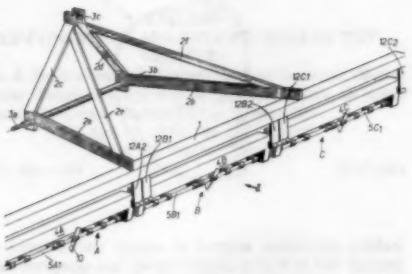
Patrick J. Ballu, Reims, France, assignor to Tecnoma, Epernay, France

Filed May 14, 1982, Ser. No. 378,274

Claims priority, application France, May 20, 1981, 81 10012

Int. Cl.³ A01M *21/00*

U.S. Cl. 47—1.5 **4 Claims**



1. A device for depositing a treatment liquid, such as a weedkiller, on plants, when it is moved in a predetermined direction in relation to said plants, this device comprising at least one tank for liquid, at least one wick extending linearly outside of said tank and transversely to said predetermined direction for transferring the liquid contained in the tank to the ends of the said wick, wherein the tank, which has a horizontally elongate shape and a cross-section which is greater than that of the wick, has end portions extended downwards defining at least two chambers, and at least one dispensing tube, which is mounted underneath the bottom of said elongate tank and parallel to its longitudinal axis, the ends of such dispensing tube being mounted so as to pivot, in a leaktight manner, in bearings disposed in the facing walls of said two chambers so that said dispensing tube is fed with liquid from said tank through said two chambers, and wherein this dispensing tube has a cross-sectional shape similar to that of the said wick, and at least two inlet or branches in which the ends of the wick are immobilized by clamping and sealing means, and which are disposed in relation to said dispensing tube, so that the remainder of said wick extends otherwise unsupported in a spaced and substantially parallel relationship to said dispensing tube and said tank, and in front of said dispensing tube and said tank in said predetermined direction.

4,463,522

SYSTEM AND APPARATUS FOR PLANT TISSUE CULTURE PROPAGATION

Eckhart Lindemann, 1318 State St., Ithaca, N.Y. 14850

Division of Ser. No. 060,539, Jul. 26, 1979. This application Jul. 13, 1981, Ser. No. 282,788

Int. Cl.³ A01G *31/00*

U.S. Cl. 47—58 **5 Claims**

1. A method for tissue culture propagation of plants which comprises:

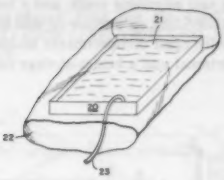
(a) sterilizing a plant tissue culture medium in a receptacle, said growth medium adapted to support differentiating growth of the plant tissue culture to be inoculated therein, as well as adapted to support maintenance of a hardened-off plantlet prior to transplant,

(b) inoculating said plant tissue culture medium in said receptacle with a plant tissue culture,

(c) enclosing said inoculated plant tissue culture medium

receptacle in a plant growth light transmitting flexible plastic envelope,

(d) maintaining said envelope under conditions which cause formation of a rooted plantlet,



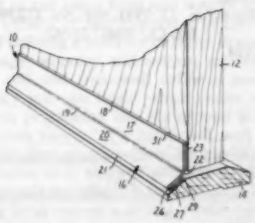
(e) hardening off said plantlet by providing an opening in said envelope of a size sufficient to allow the interior of the envelope to approach the ambient relative humidity at a rate insufficient to cause irreversible leaf drying or fatal plant shock.

4,463,523

WEATHERSTRIP ASSEMBLY FOR ENTRY DOOR

John J. Mailand, Wyoming Township, Chisago County, and Charles D. Huber, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 16, 1982, Ser. No. 358,829
Int. Cl.³ E06B *7/16*
U.S. Cl. 49—478 **6 Claims**



1. A weatherstrip assembly adapted to seal between the bottom of an exterior door and an inner surface of its threshold, said assembly comprising:

an integral polymeric extrusion comprising a stiff strip-like portion having first and second generally parallel edges, and a flexible strip-like portion extending from the second edge of said stiff portion and having an outer edge generally parallel to said second edge, said stiff and flexible portions defining an inner surface;

means for attaching said stiff portion to the vertical surface of a said door with the flexible portion extending below the bottom edge of the door;

a pair of magnetically attracted strips including a first strip attached on said inner surface along said flexible portion adjacent said outer edge, and a second strip; and

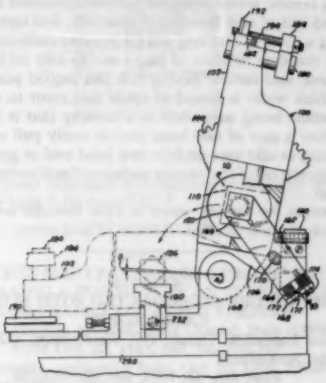
means for attaching said second strip to the inner surface of a said threshold in a position to afford separable face-to-face contact of said strips due to magnetic attraction therebetween when the door is closed.

4,463,524

INDEXABLE INSERT GRINDING MACHINE

Lawrence A. Schott, 15940 Warwick Rd., Detroit, Mich. 48223, and Roger A. Schott, 13559 Rutland, Detroit, Mich. 48227

Filed Dec. 26, 1978, Ser. No. 972,704
Int. Cl.³ B24B *17/02*
U.S. Cl. 51—127 **5 Claims**



1. A machine for grinding the flat edges of polygonally shaped cutting inserts which comprises:

(a) a grinding wheel having a flat grinding surface,

(b) a means for rotating said wheel,

(c) an insert holder for an insert to be ground comprising a movable body positioned adjacent said wheel,

(d) first means on said holder to mount an insert for rotation,

(e) second means to drive said first means to cause rotation of an insert during a grinding operation,

(f) means for mounting said grinding wheel comprising a rotating shaft on a first axis, a massive bushing having a bearing recess to receive said shaft, means pivotally mounting said bushing on a second axis parallel to said first axis wherein said bushing and said shaft may oscillate about said second axis, and an eccentric drive to oscillate said bushing, said shaft and said grinding wheel, and

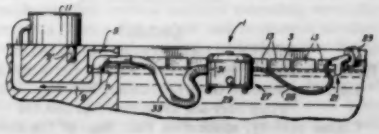
(g) said means pivotally mounting said bushing comprising a mounting shaft on said second axis having a threaded portion, a rotatable means threaded on said shaft supporting said bushing, and means to rotate said rotatable means to lift or lower said bushing and said wheel to adjust the vertical position of said wheel.

4,463,525

HAND-HELD CLEANING TOOL WITH REMOTE WATER TURBINE POWER SOURCE

Thomas F. Sheber, 640 W. Chapala Dr., Tucson, Ariz. 85704

Filed Feb. 22, 1982, Ser. No. 351,145
Int. Cl.³ B24B *23/02*
U.S. Cl. 51—170 R **9 Claims**



1. Apparatus for removing mineral deposits from interior surfaces of water-containing vessels, said apparatus comprising in combination:

(a) a hand-held tool having a rotary drive shaft;

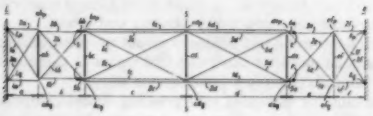
(b) a grinding wheel attached to said drive shaft;
(c) a relatively long flexible drive cable assembly having a non-rotary housing and a coaxial rotary cable core element, said drive cable assembly having a first end and a second end, said first end being connected to said hand tool, said cable core element being operatively coupled to said drive shaft to translate rotation of said cable core element to said drive shaft;
(d) a remote water-powered turbine connected to said second end of said drive cable assembly, said turbine including a rotor operatively coupled to said cable core element to translate rotation of said rotor to said cable core element, said turbine having first and second ports through which water is forced to cause said rotor to rotate, said turbine being supported in a housing that is buoyant to allow a user of said hand tool to easily pull said turbine along as said user deploys said hand tool to grind mineral deposits off of the interior surfaces of said swimming pool; and
(e) means for forcing water to flow through said first and second ports to effect rotation of said rotor.

4,463,526

STIFF GIRDER CONSTRUCTED WITH FLEXIBLE CABLE ROPES

Johannes Lagendijk, Octant 197, Sterrenburg, 3328 SL Dordrecht, Netherlands

Filed Jan. 22, 1982, Ser. No. 342,194
Claims priority, application Netherlands, Jan. 23, 1981, 8100332; Jul. 27, 1981, 8103524
Int. Cl.³ F04B 7/00
U.S. Cl. 52—83 **10 Claims**



1. In a stiff flat girder with at least two spacings, consisting of a top- and a bottom chord, compression members between the top and bottom chord and diagonal bracings in the spacings, with at least four fixed mountings, two of which are at each end, in which the fixed mountings are situated in the plane of the girder and the load acts in the plane of the girder and substantially perpendicular to the girder and in which the fixed mountings are adapted to withstand, apart from the service loading, tensional forces in the direction of the girder; the improvement in which the top chord (p) and the bottom chord (q) of the girder and the diagonal bracings each consist of at least one flexible cable/rope, in which—excluding the fixed mountings (Lp, Lq, Lm, Rp, Rq, Rm)—said compression members (ab, bc, cd, . . .) act as struts and are fitted between the top and bottom chord-cables (p, q) at those corresponding points-of-intersection (abp, abq, bcp, bcq, . . .) at which diagonal bracing cables join the top and bottom chord-cables, and in which at least one said chord-cable continues uninterruptedly between mutually facing fixed mountings and follows at least once the direction of a said diagonal bracing.

4,463,527

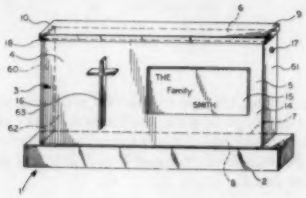
GRAVE MARKER FOR MEMORIAL

Helmut Schlösser, Bottrop, Fed. Rep. of Germany, assignor to Kühl Bauelemente GmbH, Bochum, Fed. Rep. of Germany

Filed May 28, 1982, Ser. No. 383,126
Claims priority, application Fed. Rep. of Germany, Jun. 3, 1981, 3121949
Int. Cl.³ E04H 13/00
U.S. Cl. 52—103 **7 Claims**

1. A memorial for a single grave or multigrave plot, comprising:

a base;
a hollow upwardly open polyhedral sheet-metal body mounted on said base and having a plurality of angularly adjoining walls, at least one butt weld between ends of an aluminum sheet forming said body and bent at edges connecting said adjoining walls, and a bottom;
a partition subdividing an interior of said body into at least two upwardly open compartments including a tool-storage compartment and a heater-storage compartment; and



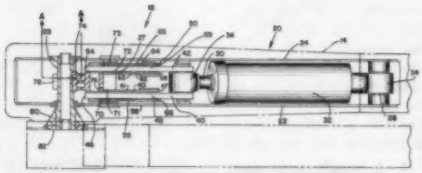
a cover movably mounted on said body for closing the upper ends of both of the compartments thereof whereby access is afforded to the interior of said body and to said compartments by movement of said cover into an open position, said cover having an upstanding edge and a downwardly inclined floor extending over both compartments and provided at its low point with an outlet opening into the water-storage compartment whereby water is collected in said body.

4,463,528

ARTICULATED AERIAL BOOM AND AN ELBOW LINKAGE ASSEMBLY THEREFORE

Leonard L. Johnson, Fort Wayne, Ind., assignor to Teco, Inc., Ft. Wayne, Ind.

Filed Jun. 12, 1981, Ser. No. 272,986
Int. Cl.³ B66C 23/62
U.S. Cl. 52—114 **11 Claims**



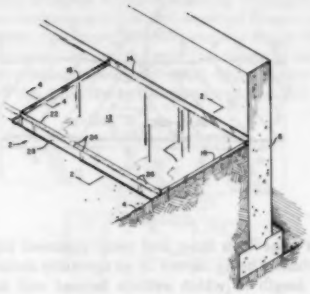
1. An articulated aerial boom comprising a platform base, a lower aerial boom having opposite upper and lower ends thereof pivotably mounted at said lower end thereof to said base and having a range of motion of 360° about a generally vertical axis, said lower boom also being movable from a first position generally parallel to said base to a second position generally perpendicular to said base, an upper aerial boom having opposite proximal and distal ends, an elbow linkage interconnected between said proximal end of said upper boom and said upper end of said lower boom, means for removably securing said linkage to said upper and lower booms thereby enhancing removal and replacement of said elbow linkage, said upper and lower booms being movable between a first position thereof in which said upper and lower aerial booms adjoin at said distal and lower ends thereof, respectively, and a second position thereof in which said upper aerial boom defines an angle of at least 210° with said lower aerial boom.

4,463,529

COMBINED LANDSCAPING AND FOUNDATION WALL PROTECTIVE ARTICLE

Ronald E. Singer, 2060 Fenton, Edgewater, Colo. 80214, and Raymond A. Stewart, 12099 E. Louisiana, Aurora, Colo. 80012

Filed Mar. 9, 1983, Ser. No. 473,725
Int. Cl.³ E02B 11/00; E02D 5/00, 19/00
U.S. Cl. 52—169.5 20 Claims



1. A pan for the protection of the ground adjacent a foundation wall including, in combination:

a bottom, said bottom having a back-edge, a front-edge and at least one side-edge, said bottom being composed of puncture resistant liquid impermeable initially imperforate material;

a back-wall, said back-wall rising from and substantially continuously connected to said bottom along said back-edge of said bottom;

at least one side-wall, each said side-wall rising from and substantially continuously connected to said bottom along each side-edge of said bottom; and

a front-wall, said front-wall spaced from said back-wall and connected to and rising from said bottom at a location at or in the vicinity of said front-edge of said bottom, said front-wall defining a plurality of liquid drainage openings therethrough; whereby said bottom, said back-wall, said side-wall and said front-wall define a pan, which pan substantially prevents liquid which enters said pan from above from penetrating into the ground below said pan adjacent such portion of a foundation wall along which said pan has been placed with its back wall juxtaposed to the foundation wall, said pan allowing any such liquid to drain from said drainage openings at a controlled flow rate at a distance from said foundation wall.

4,463,530

FLAME-VIEWING WINDOW ASSEMBLY

Breithaupt, Albert, Cologne, Fed. Rep. of Germany, assignor to Trube & Kings KG, Cologne, Fed. Rep. of Germany

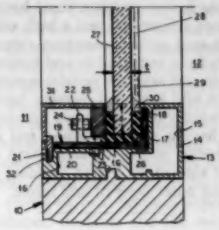
Filed Nov. 2, 1981, Ser. No. 317,320
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 3041385
Int. Cl.³ E06B 7/12
U.S. Cl. 52—171 10 Claims

1. A fire window assembly adapted to separate a fire space from another space, said assembly comprising:

a frame having an inwardly open channel all around the frame;

a pane of soda lime glass having a thickness of at least 3 mm received in said frame with a continuous peripheral edge portion extending into said channel to a depth less than 16 mm;

a bedding mass of low thermal conductivity enclosing said edge portion in said channel and thermally insulating said pane from said frame, said pane being composed of a lime-soda-silicate glass with a product of thermal coefficient of linear expansion and modulus of elasticity which is greater than $0.5N \cdot mm^{-2} \cdot K^{-1}$.

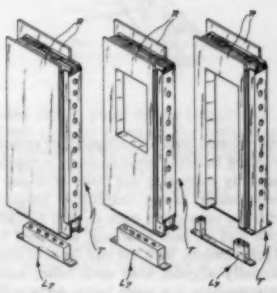


4,463,531

PROCESS FOR MANUFACTURING A FRAME SUITABLE FOR ENCASING A PORTION OF AN EXTERNAL WALL AND FRAMES OBTAINED THEREOF

Sergio Iorio Peretto, Arensod/Sarre (Aosta), Italy (11010)

Filed Oct. 20, 1981, Ser. No. 313,197
Claims priority, application Italy, Oct. 23, 1980, 25528 A/80; Aug. 4, 1981, 23363 A/81
Int. Cl.³ E06B 1/04; E04C 2/30
U.S. Cl. 52—204 18 Claims



1. A frame having an inner face and an outer face for use as a portion of an external wall of a building, constructed by assembling and encasing a plurality of such frames, said frame comprising:

an upper horizontal C-shaped section channel member and first and second vertical C-shaped section channel members;

each said C-shaped section channel member including a pair of spaced flanges joined by a web, with end portions of said flanges opposite said web being bent inwardly toward each other to define a mouth;

said C-shaped section channel members being rigidly assembled with said first vertical member extending vertically downwardly from a first end of said horizontal member and with said mouth of said first vertical member facing inwardly of said frame, with said second vertical member extending vertically downwardly from said horizontal member at a position spaced longitudinally thereof from said first vertical member and with said mouth of said second vertical member facing outwardly of said frame, and with said mouth of said horizontal member facing upwardly;

vertically spaced stiffener members positioned between and fixed to said spaced flanges of said vertical members, said

stiffener members extending substantially at right angles to the respective said spaced flanges;

cladding panels positioned on said inner and outer faces of said frame, each said cladding panel having vertical side edges between a front side and a back side; and

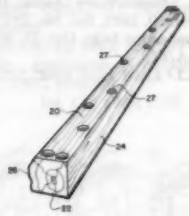
a pair of Z-shaped section members extending vertically downwardly from and fixed to said horizontal member at a position adjacent said first vertical member and inwardly thereof, each said Z-shaped member having a flange extending outwardly from said inner and outer faces of said frame and having opposite inside and outside vertical surfaces forming means for supporting and positioning said vertical side edges of said cladding panels to cover said inner and outer faces of said frame.

4,463,532

PREFABRICATED WALL UNIT FOR LOG BUILDING CONSTRUCTION, METHOD OF PRODUCING SAME AND METHOD OF CONSTRUCTING LOG BUILDING THEREWITH

Garland Faw, Kannapolis, N.C., assignor to Precision Interlock Log Homes, Inc., Mooresville, N.C.

Filed Jun. 29, 1981, Ser. No. 278,051
Int. Cl.³ E04B *1/10*
U.S. Cl. 52—233 **19 Claims**



1. A prefabricated wall unit adapted for connection with like wall units in log building construction, comprising a plurality of longitudinally extending log units arranged co-planarly in stacked relationship along respective longitudinal surfaces thereof with the respective ends of said plurality of log units forming one end of said wall unit arranged in alternatingly staggered relationship, with the end faces of alternate log units being essentially aligned with each other and with the end faces of intermediate log units being essentially aligned with each other and in staggered relation with respect to the end faces of said alternate log units, for joinder of said one end with the like end of a like wall unit to form a building corner of mortise-and-tenon appearance, and said log units being provided respectively with a plurality of bores extending transversely therethrough between the respective longitudinal surfaces thereof at spacings along the longitudinal extents thereof and adjacent opposite longitudinal sides thereof, the respective bores of each log unit of each pair of adjacently stacked log units being staggered in relation to the bores of the other log unit of said pair, each pair of adjacently stacked log units being joined together by plural connecting means extending through the bores of one log unit of said pair and penetrating only the other log unit of said pair, whereby each log unit is directly affixed only to each adjacently stacked log unit and whereby said plurality of log units are rigidly integrated.

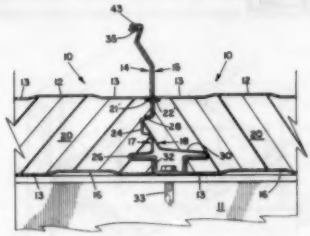
4,463,533

SHEET MATERIAL ROOFING PANEL

Willis J. Mullet, 1574 Cleveland Rd., Wooster, Ohio 44691

Filed Jun. 24, 1982, Ser. No. 391,500
Int. Cl.³ E04F *15/14*; E04D *1/00, 1/34*
U.S. Cl. 52—394 **10 Claims**

1. A sheet material roofing panel having a web and upstanding male and female edge flanges adapted to be slidably interlocked with the complementary edge flanges of laterally adjacent like panels solely through laterally converging movement relative to the laterally adjacent panels in the plane of the panel supporting surface of the roof, the female edge flange having a downwardly open channel along its upper edge terminating in a resilient downturned inclined leg, and the male edge flange having an upwardly open U-shaped channel along the inside of



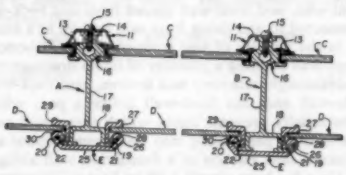
its upper edge with inner and outer upturned legs, said U-shaped channel being carried by an upwardly inclined angular leg, the length of which extends beyond said downturned inclined leg of said downwardly open channel, said downturned leg of said downwardly open channel being substantially parallel to said inclined angular leg and adapted to snap thereover and interlock within said upwardly open channel on an adjacent panel as said panels are moved laterally together.

4,463,534

GREENHOUSE STRUCTURES AND METHODS FOR THEIR CONSTRUCTION

T. P. Crigler, 851 S. County Line Rd., Hinsdale, Ill. 60521

Filed Aug. 26, 1982, Ser. No. 411,900
Int. Cl.³ A01G *9/00*; E04B *7/18*
U.S. Cl. 52—395 **7 Claims**



1. A greenhouse structure comprising a pair of rails in spaced parallel relation, a glass panel, means for attaching the side edges of said glass panel to an upper portion of said rails, each of said rails having at its lower portion a rim running longitudinally along said rail, a strip of plastic material extending beneath each of said rails and about said rim, said material providing above said rim a pair of lips, and a bendable panel one side edge of which is engaged between the lips of said material which extends about the rim of one of said rails and the other side edge of which is engaged between the lips of said material which extends about the rim of the other of said rails.

4,463,535

GLASS STOP ASSEMBLY

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Sep. 27, 1982, Ser. No. 423,919
Int. Cl.³ L04F *15/14*
U.S. Cl. 52—397 **8 Claims**

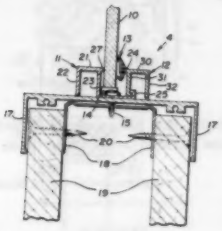
1. A demountable glass stop assembly defining a recess for mounting and retaining the edge of a glass pane on a supporting base, comprising in combination,

a. a first elongate member generally U-shaped in cross-section and comprising a base and a pair of flanges extending therefrom, one flange proximal and one flange distal with respect to said recess,

a planar arm extending from the edge of said proximal flange adapted to rest on said supporting base in a direction perpendicular to said flange and directed away from said first elongate member,

said planar arm terminating in a hook directed back toward said first elongate member,

b. a second elongate member generally U-shaped in cross-section comprising a base and a pair of flanges extending therefrom, one flange proximal and one flange distal with respect to said recess, the proximal flange of said second elongate member being provided with a detent directed toward the distal flange of said second elongate member,



said detent being adapted to be engaged by the hook of the planar arm of said first elongate member, the base of said second elongate member extending beyond said proximal flange to form a protuberance, the ends of the distal flanges of said first and said second elongate members being substantially co-planar with the lower surface of said planar arm, and

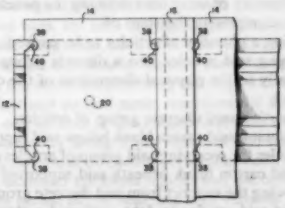
c. an elongate glazing spline formed of an elastomeric material having a notch provided therein for engaging the protuberance of said second elongate member and having means for engaging the surface of a glass pane positioned in the recess between said first and said second elongate members, said glazing spline providing a biasing force urging said second elongate member in a direction away from said first elongate member and thereby maintaining said hook and said detent in locking engagement.

4,463,536

DECORATIVE CEILING OR WALL

Joseph A. Anderle, Clifton, and James Dodich, New Milford, both of N.J., assignors to Levolor Lorentzen, Inc., Lyndhurst, N.J.

Filed May 1, 1981, Ser. No. 259,658
Int. Cl.³ E04B 5/52
U.S. Cl. 52—488 **4 Claims**



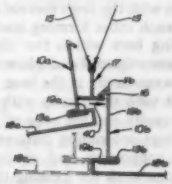
1. A covering system for connection to a ceiling or wall, comprising: at least two carriers, each carrier being an elongated relatively shallow body having a longitudinal axis, a central part extending in a first plane, and two parallel spaced marginal portions extending in a second plane parallel to and spaced from said first plane; each marginal portion having cutouts leaving roughly T-shaped portions in said second plane and spaced from each other laterally of said longitudinal axis at predetermined substantially equal distances, each T-shaped portion having arms oppositely facing with respect to each other in longitudinal direction of the respective marginal portion; pairs of T-shaped portions of opposite marginal portions being aligned with each other transversely to said longitudinal axis, each arm having a tab with an end tip, and a plurality of elongated first slats extending transversely to said at least two carriers, each slat having parallel edge portions respectively removably and positively held between oppositely facing tabs of adjacent T-shaped portions and the respective marginal portion.

4,463,537

CLIP FOR SUSPENDING CEILING PANELS

Daniel V. Rodriquez, Inglewood, and Roger S. Daniels, Santa Monica, both of Calif., assignors to Integrated Ceilings, Inc., Los Angeles, Calif.

Filed Jan. 29, 1982, Ser. No. 343,724
Int. Cl.³ E04B 5/52
U.S. Cl. 52—489 **18 Claims**



1. A suspended ceiling panel system comprising:

a grid of T-bar support members for ceiling panels, each having a cross-section having a substantially symmetrical inverted T-shape configuration;

a plurality of ceiling panels for suspension from said T-bar support members; and

sheet metal clip means for securing said panels to said T-bar support members, with the edges of said panels adjacent oneanother immediately below one of said T-bar support means;

said clip means being formed of a springy sheet metal strip material, and clip means on adjacent panels including oppositely facing hook means at adjacent panel edges for independently engaging the upper surfaces of laterally extending portions of one of said T-bar support members, and also including means for attaching said clip to said ceiling panels, and said clip means further including extension means between said hook means and said securing means for spacing said hook means and said securing means apart by a distance sufficient to provide manual access to the clip means of any panel when the adjacent panel is raised;

whereby a ceiling system is provided with concealed T-bar supports, uninterrupted fully exposed adjoining panels, and easy access to the space above the panels.

4,463,538

REINFORCING NETWORK FOR CONCRETE STRUCTURE

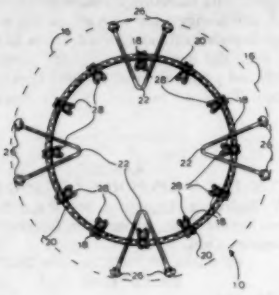
Alfred R. Dragunas, 8 Hazel Rd., Port Washington, N.Y. 11050

Filed Jan. 21, 1982, Ser. No. 341,493
Int. Cl.³ E04C 5/16; E04B 1/40
U.S. Cl. 52—677 **5 Claims**

1. A longitudinally extending reinforced concrete structure comprising:

a plurality of longitudinal reinforcing bars and transverse stirrups connected with each other comprising a reinforcing network, the stirrups being formed from reinforcing bars, having ribs and deformations on the outer surface thereof;

said stirrups having a plurality of releasably anchored and longitudinally and rotationally shiftable clips engaging said reinforcing bars and locating them in a desired pattern, the clips comprising spring steel bent into a U-shaped



configuration with the arms thereof further bent inwardly and toward each other forming hooks for securely holding reinforcing bars within the clips, each clip having holes in the arms thereof and a base from which the arms extend with a concavity in the base, the clip having three point contact with the stirrup with the stirrup engaging with the concavity and the edge of each hole; and

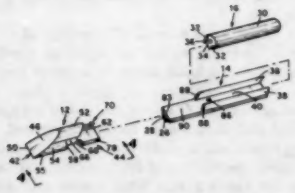
a plurality of legs protruding outwardly from the stirrup member for supporting and centering the reinforcing network in formwork for forming the structure.

4,463,539

MEANS FOR SECURING THE COMPONENTS OF A DECORATIVE MOLDING SYSTEM

Melvin L. Simon, Concord, Tenn., assignor to Vinylex Corporation, Knoxville, Tenn.

Filed Sep. 25, 1981, Ser. No. 305,616
Int. Cl.³ E04C *2/38*
U.S. Cl. 52—717 **3 Claims**



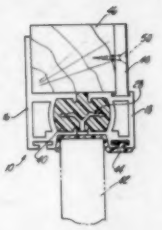
1. A molding system for unitary adhesive attachment to a mounting surface, comprising a channel member including a pair of opposed longitudinal ribs interconnected by an adhesive-backed web, a resilient decorative trim member secured between said ribs in spaced relation with said web, and an end tip comprising an exposed decorative portion and an elongated end portion having side walls which are proportioned to engage said opposed longidutinal ribs with an interference fit, and means for interconnecting said end portion to said web, said means including an attachment member on said elongated end portion which extends outwardly from the longitudinal axis of said elongated end portion towards said web, said attachment member being integral with said end portion, means defining a cavity in said web, said cavity in said web being positioned under said attachment member to receive said attachment member when said end tip is properly positioned longitudinally of said web, the depth of said cavity being greater than the length of said attachment member to prevent contact between said attachment member and said mounting surface, whereby insertion of said end portion into said channel member causes said attachment member to become engaged in said cavity so that movement of said end tip relative to said channel member is effectively prevented.

4,463,540

EXTRUSION FOR INSULATED BUILDING CONSTRUCTIONS

Alfred J. Gordon, Mosinee, Wis., assignor to Alexander J. Gordon, Farmington Hills, Mich.

Filed Sep. 14, 1981, Ser. No. 301,700
Int. Cl.³ E04C *3/30*
U.S. Cl. 52—730 **3 Claims**



1. Apparatus for constructing insulated windows, curtain walls and the like, said apparatus comprising:

first and second elongated metal sections having spaced opposing surfaces joined by a plug of insulating material, and a generally T-shaped reinforcing section made of the same material as the first and second sections, said reinforcing section having arm portions extending substantially across and being substantially surrounded by the insulator plug while being spaced from the opposing surfaces of the first and second sections, with the reinforcing section having a leg portion extending to the periphery of the plug in a space between the first and second sections previously occupied by a bridging section therebetween.

4,463,541

APPARATUS AND METHOD FOR AUTOMATICALLY PACKING ARTICLES IN CATONS

Ulrich G. Nowacki, Leisure City, Fla., assignor to International Paper Company, New York, N.Y.

Filed Jul. 13, 1981, Ser. No. 282,593
Int. Cl.³ B65B *11/20*
U.S. Cl. 53—447 **13 Claims**

3. A method for packing a plurality of paperboard cartons, each said carton being initially in the form of a carton blank having a plurality of score lines defining the panels and flaps of the carton, comprising the steps of:

(a) feeding a plurality of articles to be packed;

(b) forming said articles into a discrete group conforming generally to the physical dimensions of the cartons to be packed;

(c) supporting said discrete group of articles;

(d) positioning said carton blank below said supported group of articles for receiving said group of articles and supporting said carton blank beneath said supported group;

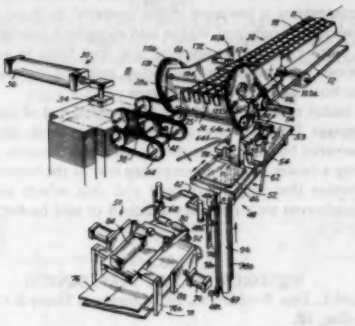
(e) removing the support from said discrete group of articles, causing said articles to drop onto said carton blank;

(f) folding said carton blank to wrap the blank around the group of articles to form a carton;

(g) simultaneous with said folding step (f), feeding an additional plurality of articles to be packed, forming a next discrete group of said articles to be packed and supporting

said next group of articles until said folidng step is substantially completed;

(h) positioning a next carton blank below said supported next



group of articles for receiving said group of articles and supporting said carton blank beneath said group of articles; and

(i) repeating said steps (e)–(h) above.

4,463,542

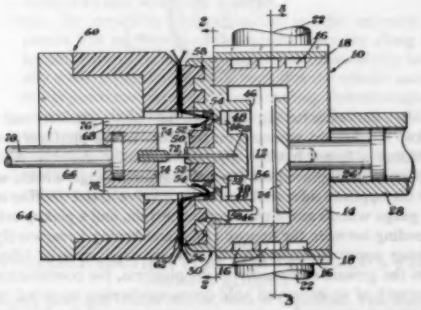
METHOD FOR FORMING HEAT SEALS

Eddie L. Greenawalt; Steve C. Ray, both of Lake Jackson, and Daniels S. Garner, Richwood, all of Tex., assignors to Package Machinery Company, East Longmeadow, Mass.

Division of Ser. No. 129,968, Mar. 13, 1980, Pat. No. 4,350,003. This application Mar. 10, 1982, Ser. No. 356,970

Int. Cl.³ B65B *51/20*

U.S. Cl. 53—479 **2 Claims**



1. The improved method for forming heat seals across the width of a tube work product in the process of converting the tube into filled bags, the tube having longitudinally extending side gussets and a lap seam, each of which forms a longitudinal region of increased thickness in the tube due to the plurality of plies therein, the method comprising the steps of clamping the tube along first and second zones transverse of the tube and spaced from one another in the longitudinal direction, parting the tube transversely along a line between and remote from said clamped zones and extending across the width of the tube through the increased thickness regions and the other regions, separating the parted edges, applying high velocity heated gas streams to the parted edges at the increased thickness regions for one period of time, applying high velocity heated gas streams to said parted edges at the other regions for another period of time less than said one period of time, and, thereafter terminating said flow of heated gas and positively cooling said parted edges prior to releasing the clamping pressure.

4,463,543

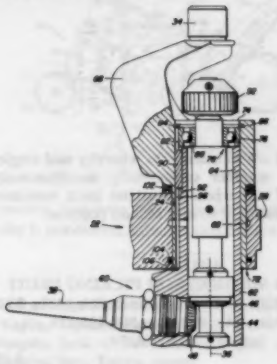
COTTON PICKER BAR

Arthur L. Hubbard; Russell D. Copley, both of Ankeny, and Ronald L. Reichen, Alleman, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 20, 1982, Ser. No. 420,155

Int. Cl.³ A01D *46/18*

U.S. Cl. 56—44 **12 Claims**



1. In a cotton harvesting unit having a rotatable drum head rotatably supporting an upright, spindle-carrying picker bar, said picker bar having a generally hollow, circular cross section; a cam arm connected to the upper end of the picker bar and a cam member engaging the cam arm to orient the picker bar about its axis as the drum head rotates, and a shaft extending through the bar for driving the spindles, the improvement comprising: said cam arm including a downward extension having a circular, constant-diameter bore extending vertically therethrough, wherein the upper end of the picker bar extends upwardly into the bore terminating therein at an upper end substantially above the drum head and below the top of the bore and defining therewith a bearing-receiving area; a bearing supported in the area, the diameter of said bearing being approximately equal to the bore diameter but greater than the inner diameter of the picker bar, said bearing journalling the spindle drive shaft for rotation with respect to the cam arm and picker bar; means for fixing the upper end of the picker bar against rotation in the bore; wherein the cam arm extension extends downwardly a substantial distance into the drum head and has a cylindrical outer surface of substantially constant diameter from a location adjacent the upper end of the bar to and including the lower end of the extension, and wherein the drum head includes a complementary cylindrical surface and the extension defines a picker bar journal rotatably supported in the complementary surface.

4,463,544

EDGER

Anthony Carsello, Chino, and James J. Michel, Agoura, both of Calif., assignors to Allegretti & Company, Chatsworth, Calif.

Filed May 3, 1982, Ser. No. 374,429

Int. Cl.³ A01D *53/14*

U.S. Cl. 56—17.1 **34 Claims**

14. An edger, comprising:

a rear wheel assembly;

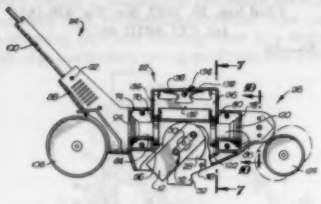
a front wheel assembly;

a housing supported between said rear and front wheel assemblies for substantially simultaneous rotation about a generally longitudinal axis with respect thereto;

a cutting blade carried by said housing for relatively high speed rotation within a generally longitudinal plane; and

locking means including a single integral actuator member engageable with both of said wheel assemblies and carried

by said housing for movement between a first position preventing rotational movement of said housing with respect to said wheel assemblies and a second position permitting rotational movement of said housing with



respect to said wheel assemblies whereby said single integral actuator member substantially simultaneously releases both of said wheel assemblies upon movement of said actuator member to said second position.

4,463,545

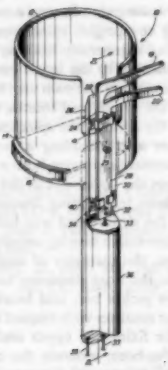
TOOL AND METHOD FOR PICKING FRUIT

Sam J. Giallanza, 8207 E. Coolidge, Scottsdale, Ariz. 85251

Filed Mar. 14, 1983, Ser. No. 475,139

Int. Cl.³ A01D *46/24*

U.S. Cl. 56—337 **2 Claims**



1. An apparatus for removing fruit from a fruitbearing plant comprising, in combination:

(a) elongated handle means for handling and extending said apparatus;

(b) a bracket bar coupled to an extended end of said handle means, said bracket bar forming a cutting implement at its uppermost edge, said bracket bar including upper and lower spacing brackets operably secured to said bracket bar by rivets;

(c) guide-arm means slidably retained by said bracket bar for engaging and guiding said fruit into a desired position, said guide-arm means being operably engaged by said spacing brackets which retain said guide-arm means in a parallel position to and at a spaced distance from said bracket bar, said guide-arm means comprising a toothed guide head having an upper tooth and a spaced lower tooth which define a stem channel, said guide head being utilized to position and guide a stem of said fruit between said upper tooth and lower tooth to thereby facilitate severing said fruit from said stem by said cutting means;

(d) operating means for controlling the operation of said guide-arm means comprising raising means for controllably elevating said guide arm means to an extended position to engage and guide said fruit, said raising means comprising a raising string operated by hand which is operably contained within said elongated handle means and lowering means for controllably returning said guide-arm means to a retracted position to activate a cutting means to sever said fruit from its associated stem, said lowering means comprising a lowering string operated by hand which is operably contained within said elongated handle means;

(e) cutting means for severing said fruit from its associated stem, said cutting means being actuated by said sliding action of said guide-arm means ; and

(f) basket means coupled to said extended end of said handle means for receiving and storing said fruit after being severed by said cutting means, said basket means comprising a basket having an emptying tray at the bottom of said basket that may be opened and shut which slides into horizontal slots operably attached to said basket.

4,463,546

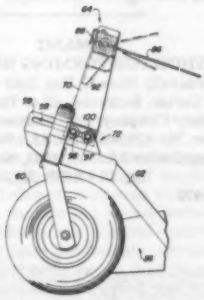
WINDROW PICKUP MECHANISM

Richard L. Day, Port Byron, Ill., assignor to Deere & Company, Moline, Ill.

Filed Aug. 9, 1982, Ser. No. 406,639

Int. Cl.³ A01D *89/00, 43/00*

U.S. Cl. 56—364 **10 Claims**



1. In a harvester having a forward harvesting platform and a pickup mechanism mounted on the front of the platform and including a frame having opposite vertically shiftable sides respectively supported on ground engaging gauge wheels so that the opposite sides shift vertically relative to one another as the gauge wheels move over uneven terrain, and a pickup belt extending between the opposite sides and having a rearwardly moving upper run operative to convey crop material lifted from the ground rearwardly to the platform, the combination therewith of an improved hold-down mechanism mounted on the pickup mechanism above the upper run of the belt for controlling the top of the mat of crop material on the belt and comprising:

a pair of generally upright support members;

mounting means respectively mounting the lower ends of the support members to the opposite sides;

a transverse tubular member extending between the support members;

a plurality of fingers mounted on and extending rearwardly from the tubular member in cantilever fashion;

a pair of pivot means respectively connecting the opposite ends of the tubular member to the upper ends of the respective support members for free rotation of the tubular member relative to the support during operation of the machine and including means for accommodating axial misalignment between the pivot means during vertical shifting of one side relative to the other; and stop means operative between the tubular member and at least one of the support members to limit rotation of the tubular member in a direction wherein the fingers swing downwardly

to establish a minimum clearance between the fingers and the belt.

4,463,547

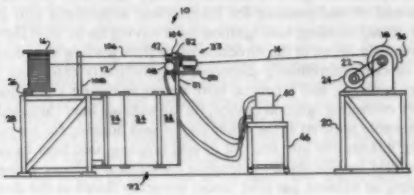
ELECTRONICALLY CONTROLLED CABLE WRAPPER

Thomas M. Young, Oakland, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 17, 1982, Ser. No. 408,998

Int. Cl.³ B65H *81/08*

U.S. Cl. 57—6 **14 Claims**



1. Apparatus for controlling the wrapping of a cable with wrapping material, the cable being adapted to move at variable rates from a supply to a takeup or utilization point, comprising:

a spindle assembly including an inner stationary spindle having a central aperture through which the cable passes and including an outer rotatable spindle rotatably mounted to the inner stationary spindle;

means, engaging the cable, for moving the spindle assembly along a portion of the cable;

means mounted on the outer rotatable spindle for storing wrapping material;

means for rotating the outer rotatable spindle to wrap the cable with said wrapping material;

means for moveably supporting the spindle assembly to permit free movement of the spindle assembly along the length of the cable in a plane extending substantially laterally with respect to the cable such that the spindle assembly is positioned by the cable extending therethrough to accommodate lateral movement of the cable to the utilization or takeup point; and

means for synchronizing the rate of movement of the spindle assembly along the length of the cable and the rate of rotation of the outer spindle.

4,463,548

PIVOTABLE SUCTION TUBE FOR TAKING UP A YARN FROM A BOBBIN

Rupert Karl, and Walter Mayer, both of Ingolstadt, Fed. Rep. of Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Indolstadt, Fed. Rep. of Germany

Filed Jun. 2, 1982, Ser. No. 384,249

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1981, 3123282

Int. Cl.³ D01H *15/02*; B65H *54/22*

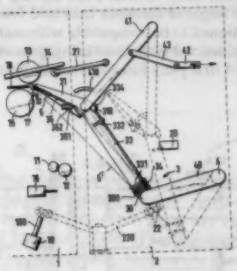
U.S. Cl. 57—263 **8 Claims**

1. A pivotable suction tube for taking-up a yarn from a bobbin and transferring the yarn to an operating element, said pivotable suction tube being of the type having a longitudinally extending slot provided in a front side of said suction tube facing the bobbin, said suction tube comprising:

a controllable closure piece carried by said suction tube associated with said elongated slot;

said closure piece having a closed position in which said closure piece substantially covers the whole length of said elongated slot and an open position in which said closure piece uncovers the whole length of said elongated slot; and

means for acting on said closure piece to move and hold said closure piece in said open and closed positions in response to said suction tube pivoting, respectively, from an initial



position to a yarn take-up position wherein said suction tube is positioned adjacent said bobbin.

4,463,549

APPARATUS FOR MAKING FASCIATED SPUN YARN

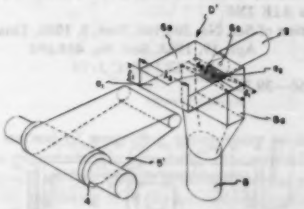
Koji Kajita, Omihachiman; Takashi Nakayama, and Seiichi Yamagata, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jun. 21, 1982, Ser. No. 390,682

Claims priority, application Japan, Jun. 30, 1981, 56-100557; Jul. 7, 1981, 56-105025

Int. Cl.³ D01H *5/28, 1/12*

U.S. Cl. 57—328 **6 Claims**



1. An apparatus for making a fasciated spun yarn, comprising: a pair of front rollers; a false twisting nozzle; and a pneumatic tube provided between said front rollers and said false twisting nozzles for allowing a bundle of fibers being twisted to pass therethrough in a linear form, said pneumatic tube being formed on its one side with an opening which has communication with an external vacuum source, wherein the improvement resides in that said pneumatic tube has a rectangular cross-section and the side opening communicating with said external vacuum source has a rectangular cross-section.

4,463,550

SILENT CHAIN

Stellios A. Avramidis, Mooresville, Ind., assignor to PT Components, Inc., Indianapolis, Ind.

Filed Sep. 21, 1981, Ser. No. 304,517

Int. Cl.³ F16G *15/14*

U.S. Cl. 59—84 **5 Claims**

1. A link set for assembly in series to form an endless silent chain comprising:

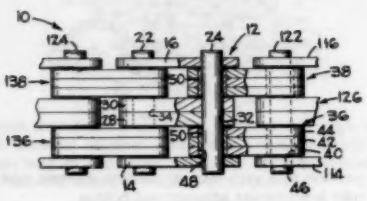
guide link means having a pair of holes positioned to determine the chain pitch;

a pair of pins non-rotatably secured to said guide link means;

a plurality of first plain links grouped into first link pack means, the latter means having a first pair of openings

sized and positioned to permit engagement of said openings directly with said pins;

a plurality of second plain links grouped into second link pack means each second pack having a second pair of openings larger in diameter than said first pair of openings and positioned to be compatible with said pins; said plurality of said second plain links being greater than said plurality of said first plain links to provide an increased bearing area;



a bushing secured in each of said second openings; and said second pack means positioned on either side of said first pack means with the bushings on one end of said second pack in articulating engagement with one of said pins and the other end extending away from the other of said pins, whereby said first pack means and said second pack means provide balanced strength from pitch to pitch throughout the length of the chain.

4,463,551

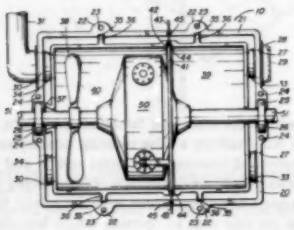
ROTARY PRIME MOVER

Harold Morris, 6 Sherwood Dr., St. John's, Newfoundland, Canada A1E 2X4

Continuation of Ser. No. 203,105, Nov. 3, 1980. This application Apr. 19, 1983, Ser. No. 484,696

Int. Cl.³ F02C *3/16*

U.S. Cl. 60—39.35 **17 Claims**



1. A rotary prime mover comprising: (A) a generally cylindrical casing, the casing including a forward, combustion-supporting air chamber fully within said casing, an aft, exhaust gas chamber fully within said casing, an axial air intake, means for drawing combustion-supporting air axially inwardly through said axial air intake into said forward combustion air chamber, an axial exhaust outlet, means for drawing exhaust gas into said aft exhaust gas chamber and for expelling said exhaust gas axially outwardly through said axial exhaust outlet, a longitudinally arranged shaft, and bearing means at each circular end thereof to support said longitudinally arranged shaft; (B) a flywheel block mounted on said longitudinally arranged shaft and arranged intermediate said air intake and said exhaust outlet between said forward, combustion-supporting air chamber and said aft, exhaust gas chamber, said longitudinal shaft having a fuel passage therethrough, said flywheel block having a main cylindrical section of slightly less diameter than the diameter of said generally cylindrical casing and lateral, frustoconical ends which assist in the movement of air from said forward, combustion-supporting air chamber to said aft, exhaust gas chamber, said flywheel block being mounted for rotation with its main cylindrical section out of contact with said generally cylindrical casing; at least two balanced, diametrically-opposed jet reaction engines recessed within and secured within said main cylindrical section of said flywheel block, each said jet reaction engine being disposed along a chord of said main cylindrical section, each said jet reaction engine having its exhaust flowing along an imaginary extension of said chord of said cylindrical section of said flywheel block, and then being drawn towards said axial exhaust outlet, each jet reaction engine comprising (i) a hollow cylindrical housing, (ii) a cylindrical ignition head threadedly adjustably secured at one end of said housing for longitudinal adjustment into and out of said housing, said ignition head having an air inlet throat outwardly flared in the direction of air flow leading to a plurality of circumferentially disposed, longitudinally extending air inlet passages, and a central bore accommodating a longitudinally extending ignition device, (iii) an exhaust liner threadedly adjustably secured at the other end of said housing for longitudinal adjustment into and out of said housing, said liner having a central longitudinally extending cylindrical exhaust passage having an exhaust gas inlet throat inwardly flared in the direction of exhaust gas flow, (iv) the longitudinal adjustment of said cylindrical ignition head and said exhaust liner providing for placement of said ignition device a predetermined longitudinal distance from said combustible fuel mixture, to provide optimum ignition characteristics, and to control the volumetric size of said combustion chamber and allowing optimum ignition/combustion, (v) an annular fuel infeed zone, and (vi) a radial fuel inlet for admitting fuel to said annular fuel infeed zone; a fuel infeed line within said flywheel block connected between said radial fuel inlet to said fuel infeed zone and said fuel passage through said longitudinal shaft, said fuel infeed line including automatically actuated valve means therein; and a source of ignition power connected to said ignition device through said casing; (C) whereby operation of said jet reaction engines causes powered rotation of said flywheel block, so that power may be taken off said longitudinally arranged shaft.

4,463,552

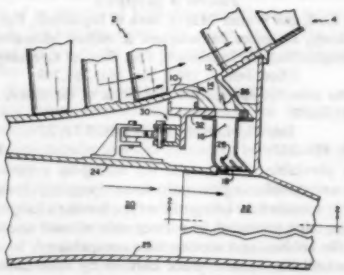
COMBINED SURGE BLEED AND DUST REMOVAL SYSTEM FOR A FAN-JET ENGINE

Richard J. Monhardt; Louis Kudlacik, both of Glastonbury; John P. Nikkanen, West Hartford, and Juri Niiler, Glastonbury, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 14, 1981, Ser. No. 330,760

Int. Cl.³ F02K *3/06*

U.S. Cl. 60—226.1 **3 Claims**



1. A combined dirt removal and surge preventive bleed system for a fan-jet engine having twin spool axial flow compressors, housed in a generally cylindrical case having an outer wall, an annular duct means generally traverse to and complementing an opening in said outer wall adjacent the juncture

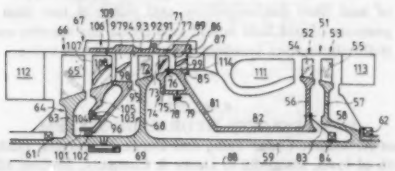
where the last stage rotor of the low pressure compressor spool ends and the first stage stator of the high pressure compressor spool begins for leading compressor air into a plurality of circumferentially spaced radially extending passageways, ducting means defining said radially extending passageways, the fan portion of the engine having inner and outer wall means defining a fan discharge duct, a plurality of stator vanes circumferentially disposed in said fan discharge duct and extending between said inner and outer walls and a plurality of openings in said inner wall adjacent the pressure surface of said stator vanes communicating with each of said circumferentially spaced passageways defined by said ducting means for discharging said compressor air into the fan discharge stream in said discharge duct and in proximity to said pressure surface of said stator vane, means for directing said compressor air at a velocity and direction that does not impair the flow of said fan discharge air and valve means disposed in each of said passageways to prevent or allow the compressor air to flow through each of said passageways and the outer wall of said generally cylindrical case bending at said juncture to change direction of said compressor air passing from said low pressure stages of said twin spool axial flow compressor to said high pressure stages of said twin spool axial flow compressors.

4,463,553

TURBOJET WITH CONTRAROTATING WHEELS

Serge Boudigues, Sceaux, France, assignor to Office National d'Etudes et de Recherches Aerospatiales, Chatillon, France

Filed May 24, 1982, Ser. No. 381,023
Claims priority, application France, May 29, 1981, 81 10725
Int. Cl.³ F02K *3/00*
U.S. Cl. 60—268 **8 Claims**



1. A turbojet comprising:

turbine means including first and second turbine wheels which rotate in opposite directions during operation of the turbojet,

multistage compressor means including an inner and an outer rotor driven by said first and second turbine wheels, respectively,

said inner rotor including a first bladed wheel and a second bladed wheel, both connected to a common inner shaft,

said outer rotor including a first bladed wheel and a second bladed wheel arranged alternately with said first and second bladed wheels of the inner rotor and arranged in axial succession upstream from said turbine means for defining an axial gas flow channel extending towards said turbine means,

said outer rotor comprising:

an outer shaft rotatably arranged around said inner shaft, and coupled to said first turbine wheel,

ring means arranged around the second blade wheel of said inner rotor and defining an outer boundary of said gas flow channel at said second bladed wheel of the inner rotor,

first connection means extending radially inwardly from said ring means towards said outer shaft, on the downstream side of said second bladed wheel of the inner rotor, said first connecting means comprising spokes crossing said gas flow channel,

said second bladed wheel of the outer rotor being connected to said first connecting means between said spokes and said outer shaft,

second connecting means between said ring means and said first bladed wheel of the outer rotor, said second connecting means extending radially inwardly on the upstream side of said second blade wheel of the inner rotor, and comprising spokes crossing said gas flow channel, and a conical flange extension supported rotatably on said inner shaft,

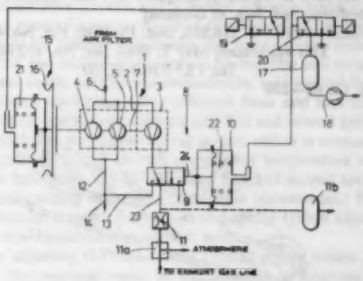
said first stage wheel of the outer rotor being supported on said conical flange.

4,463,554

METHOD OF GENERATING GAS PRESSURE IN AN INTERNAL COMBUSTION ENGINE, AND APPARATUS FOR CARRYING OUT THIS METHOD

Rainer Südbeck, Duisburg, and Hans Baumgartner, Viersen, both of Fed. Rep. of Germany, assignors to Pierburg GmbH & Co., KG.

Filed Nov. 6, 1981, Ser. No. 319,064
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1980, 3042163
Int. Cl.³ F01N *3/22*; F02B *33/36, 39/12*
U.S. Cl. 60—274 **33 Claims**



1. In a method of generating gas pressure in an internal combustion engine wherein a gas motor (2) continually driving a gas pump (3) serving for the generation of gas pressure is driven by the gas drawn in by the internal combustion engine, the improvement comprising the steps of:

driving the gas motor (2) which drives the gas pump (3) by the gas drawn in by the internal combustion engine in the lower load range of the internal combustion engine;

coupling the gas motor (2) in common with the gas pump (3) to a disc (16) driven by the internal combustion engine and driving said gas motor by said disc in the upper load range of said internal combustion engine; and

supplying the gas delivered to the gas pump (3) to the gas stream conducted through the gas motor (2).

4,463,555

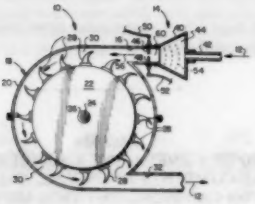
ELECTRO-DYNAMIC POWER CONVERTER

Henry V. Wilcoxson, P.O. Box 141021, Dallas, Tex. 75214

Filed Jul. 6, 1982, Ser. No. 395,651
Int. Cl.³ F15B *3/00*
U.S. Cl. 60—325 **4 Claims**

1. A method for boosting the output of a hydraulic turbine of the type having a rotor member disposed for rotation within a turbine housing comprising the steps of conducting a high energy discharge of electrical current through water flowing into the water flow inlet of a turbine housing at a high electrical intensity level which produces superheated water vapor and shock waves, and reacting the shock waves and expanding water vapor gases by the inertia of a mass of water contained

within a flow passage which diverges with respect to the water flow inlet of the turbine housing, and by reflecting a portion of



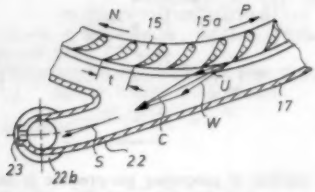
the shock waves by baffle elements disposed within the divergent flow passage.

4,463,556

HYDRODYNAMIC STARTING TORQUE CONVERTER

Erich Polzer; Gottfried Ruetz, both of Heidenheim; Herbert Schmölz, Nattheim, and Rèmy Pochon, Heidenheim, all of Fed. Rep. of Germany, assignors to Voith Getriebe KG, Heidenheim, Fed. Rep. of Germany

Division of Ser. No. 216,554, Dec. 15, 1980, Pat. No. 4,391,096.
This application May 7, 1984, Ser. No. 472,064
Int. Cl.³ F16D *33/00*
U.S. Cl. 60—330 **8 Claims**



1. A hydrodynamic starting torque converter for use in the transmission of a vehicle and operative within the traction as well as counterbraking ranges, comprising a torus-shaped working space which is defined by a stationary housing, by a rotary turbine wheel arranged for substantially centrifugal flow of working fluid therein and by a rotary pump which; means for influencing this torus stream of working fluid; a filling line for delivery of working fluid into said housing; and a draining line having an inlet portion connected with said housing, said inlet portion having a permanently open aperture for evacuation of some working fluid from said housing and said inlet portion being disposed in the region of outflow of working fluid from said turbine wheel, the orientation of said inlet portion being such that the direction of fluid flow therein coincides, at least substantially, with the direction of fluid flow toward said inlet portions within said counterbraking range.

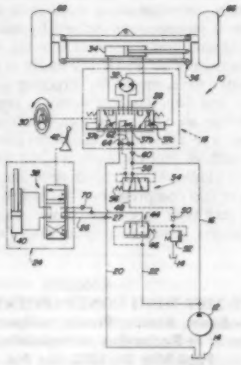
4,463,557

OPEN CENTER HYDRAULIC SYSTEM

James A. Miller, Cedar Falls, and Derek M. Eagles, Hudson, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Aug. 12, 1983, Ser. No. 522,920
Int. Cl.³ F16D *31/00*; B62D *5/08*
U.S. Cl. 60—422 **12 Claims**

1. A load sensing hydraulic system comprising:
(a) a reservoir capable of holding a quantity of fluid;
(b) a pump fluidly connected to said reservoir;
(c) a control valve having a feedback mechanism connected thereto, said control valve regulating fluid flow from said pump to a hydraulic function;
(d) a priority valve connected downstream of said pump and being movable between an open and a closed position to regulate the pressure of the fluid discharged by said pump;
(e) a load signal line connecting said control valve to said priority valve for conveying pressurized fluid thereto, said pressurized fluid urging said priority valve toward said closed position which assures that said pump will increase the pressure of discharged fluid and provide adequate fluid to said control valve; and



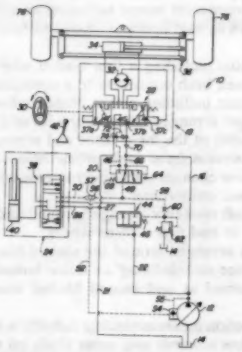
(f) means for sensing pressure variations between fluid discharged from said pump and fluid present in said load signal line and for preventing fluid flow out of said hydraulic function via said load signal line when the pressure of said fluid discharged by said pump is less than the pressure of said fluid in said load signal line thereby essentially eliminating kickback from said control valve.

4,463,558

LOAD SENSING HYDRAULIC SYSTEM

James A. Miller, Cedar Falls, and Derek M. Eagles, Hudson, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Aug. 12, 1983, Ser. No. 522,933
Int. Cl.³ F16D *31/00*; B62D *5/08*
U.S. Cl. 60—422 **12 Claims**



1. A load sensing hydraulic system comprising:
(a) a control valve having a feedback mechanism connected thereto, said control valve regulating fluid flow to a hydraulic function;
(b) a power on demand pump fluidly connected between a source of fluid and said control valve for supplying pressurized fluid thereto;

(c) a load signal line connected between said control valve and said pump for transmitting pressure signals, generated by loads acting on said hydraulic function, to said pump thereby controlling the pressure of fluid discharged by said pump; and

(d) means for sensing pressure variations between fluid discharged from said pump and fluid present in said load signal line and for preventing fluid flow out of said hydraulic function via said load signal line when the pressure of said fluid discharged by said pump is less than the pressure of said fluid in said load signal line.

4,463,559

HYDROSTATIC TRANSMISSION WITH INCHING CONTROL

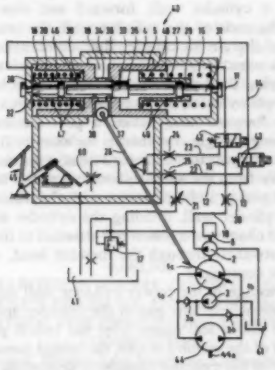
Willy Holdenried, Friedrichshafen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, A.G., Friedrichshafen, Fed. Rep. of Germany

Filed Oct. 23, 1981, Ser. No. 314,436

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1980, 3040321

Int. Cl.³ F16D *31/02*

U.S. Cl. 60—444 **6 Claims**



1. In a hydrostatic transmission having a variable displacement reversible output hydrostatic pump connected to a prime mover and formed with a control element displaceable to opposite sides of a null position to select the output direction of the transmission and controlling the speed of the output as a function of the degree of displacement of the control element from its null position, a hydrostatic motor connected in a hydraulic circuit with said hydrostatic pump and driving a load, a control pump driven by said prime mover, a control cylinder having a control piston spring biased into a null position and defining compartments on opposite sides of said piston pressurizable by said control pump, said piston being operatively connected to said element and a pedal, the improvement which comprises the combination therewith of:

an inch valve having a movable member operatively connected to said pedal and defining a flow cross section communicating between a pressure side of said control pump and a fluid return path and corresponding to the extent of displacement of said pedal, thereby enabling fine control of the position of said element even at high speeds of said prime mover at least upon initial displacement of said pedal, said inch valve comprising a sleeve formed with a supply port connected with said pressure side of said control pump, a return port connected with said return path, and a control edge partly delimiting said return port, and a shaft displaceable in said sleeve and operatively connected to said pedal, said shaft being formed with an annular groove communicating with said supply port and at least one control groove extending from said annular groove to the region of said edge and defining a variable flow cross section with said edge.

4,463,560

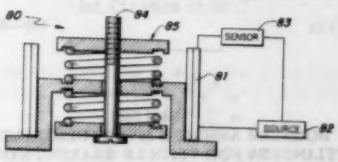
THERMAL ACTUATOR APPARATUS

Allen H. Greenleaf, Pownal, Me., and Robert L. Milamed, Swampscott, Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Oct. 18, 1982, Ser. No. 434,799

Int. Cl.³ F03G *7/06*

U.S. Cl. 60—527 **13 Claims**



1. Thermal actuator apparatus comprising:

a. a first actuator portion and a second actuator portion;

b. spring means for supporting said first and second actuator portions for relative movement, said spring means including first and second spring means having first and second thermo-elastic coefficients respectively, said second thermo-elastic coefficient being different from said first thermo-elastic coefficient, wherein said first and second spring means define a balanced spring system which is normally in equilibrium, and wherein a change in temperature will upset the equilibrium between said first and second spring means resulting in relative movement between said first and second actuator portions as said spring system adjusts to a new equilibrium condition; and

means for adjusting the initial force on said spring means for adjusting the responsiveness of the actuator to changes in temperature.

4,463,561

BRAKING-FORCE BOOSTER

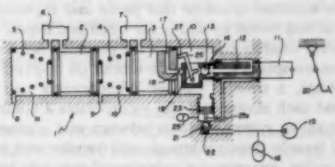
Heinz Leiber, Oberriexingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 415,942

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1982, 3215737

Int. Cl.³ B60T *13/12*

U.S. Cl. 60—547.1 **1 Claim**



1. A braking-force booster which comprises: a pressure source, a pedal-operated control valve and at least one main brake cylinder, at least one piston in said at least one brake cylinder for generating a brake pressure, said piston being exposed to a pressure created in the main brake cylinder by means of said control valve, a first connecting passage in said at least one piston between the main brake cylinder and a pressureless connection, a movable first plunger displaceable by a pedal, said plunger extending into said main brake cylinder, a valve closing member on said plunger for shutting off said first connecting channel as said plunger is moved toward

said at least one piston, a second connecting channel in said plunger, a seat valve in said second channel serving to close off said second channel, a second plunger supported on said first plunger relative to said valve closing member in said plunger for opening said seat valve closure member during a corresponding approach of said first plunger towards the main brake cylinder piston, a pressure regulator placed ahead of said seat valve in said plunger for the reduction of a pressure jump of said seat valve, said pressure regulator includes a spring loaded valve, a movable piston in said pressure chamber operatively related to said spring loaded valve, a spring backing said piston, and a second pressure source which connects with said second connecting channel.

4,463,562

BOOSTER ASSISTED HYDRAULIC MASTER CYLINDERS FOR VEHICLE BRAKING SYSTEMS

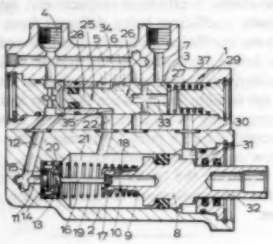
Phillip A. Taft, Solihull, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Apr. 26, 1982, Ser. No. 371,986

Claims priority, application United Kingdom, May 15, 1981, 8114925

Int. Cl.³ B60T 7/06

U.S. Cl. 60—555 **6 Claims**



1. A master cylinder assembly for a vehicle hydraulic braking system comprising a first master cylinder, and a second master cylinder, each said master cylinder comprising a housing having a bore, a pedal-operated piston working in said bore, a pressure space defined in said bore in advance of said piston, a transfer port leading from said pressure space, an inlet port for connection to a pressure source, and means defining a boost chamber to which hydraulic fluid from said pressure source is admitted to act on said piston and augment a force applied to said piston by said pedal when said master cylinder is operated, wherein connections are provided for connecting said pressure spaces to brake on wheels on opposite sides of said vehicle, a transfer passage interconnects said transfer ports, and each master cylinder incorporates a control valve for controlling communication between said pressure space and said transfer passage through said transfer port, each said control valve comprising a valve spool movable between a retracted position to close said transfer port and said inlet port and an operative position in which said transfer port and said inlet port are open, and a spring for urging said spool into said retracted position, said spool having a first pressure-responsive face exposed to said pressure space and, when subjected to pressure in said pressure space in response to operation of said pedal, is operative to urge said spool against the loading of said spring and into said operative position in which said pressure space is placed in communication with said transfer port and said inlet port is placed in communication with said boost chamber.

4,463,563

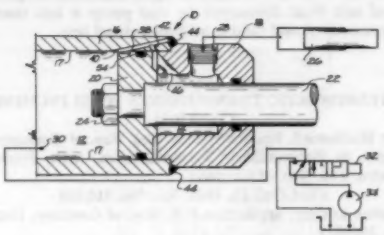
REPHASING CYLINDER CONSTRUCTION

Robert D. Krehbiel, Hutchinson, Kans., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Jun. 19, 1978, Ser. No. 917,035

Int. Cl.³ F15B 15/18

U.S. Cl. 60—593 **3 Claims**



1. A fluid power cylinder utilized in a series circuit with a slave cylinder in a master-slave relationship, the power cylinder having a cylinder wall, forward and rearward heads welded to the ends of the cylinder wall, the rearward head having a port therein for exterior fluid communication with a valve which selectively: (a) provides communication with a pump supplying fluid pressure, (b) closes off communication with the power cylinder, or (c) provides communication with a drain; the forward head having a port therein, the slave cylinder having a single port therein for exterior fluid communication with the port in the forward head; a piston rod extending outwardly from the slave cylinder; a piston having a circumferential seal in sliding contact with the inside surface of the power cylinder wall, dividing the cylinder into forward and rearward chambers, a piston rod attached to the piston and extending outwardly through the forward head, wherein the improvement comprises:

a lateral passage in the power cylinder wall positioned approximate at least one end of the cylinder and located so that the piston seal passes over the lateral passage near that end of the piston's stroke, the lateral passage opening into one of the cylinder chambers, depending on position of the piston, the passage not passing through the outside surface of the cylinder wall; and

a longitudinal bleed passage in the cylinder wall between the inside and outside surfaces of the cylinder wall joining the lateral passage with the adjacent port so that when the piston seal has passed the lateral passage approaching the end of its stroke, there is a bypass passage open between the two cylinder chambers, the passage having a sufficiently small cross-sectional area to cause the power cylinder to remain in phase with the series connected slave cylinder at the beginning of the power cylinder stroke, wherein the lateral passage passes partially through the cylinder wall and the longitudinal passage comprises a cutaway portion on the outside diameter of the cylinder wall, with the adjacent cylinder head having an overlapping portion extending longitudinally over the longitudinal passage.

4,463,564

TURBOCHARGER TURBINE HOUSING ASSEMBLY

Charles E. McInerney, Los Angeles, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Oct. 23, 1981, Ser. No. 314,214

Int. Cl.³ F02B 37/00

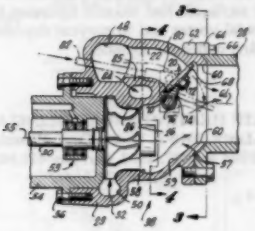
U.S. Cl. 60—602 **37 Claims**

1. A turbine housing assembly for a turbocharger, comprising:

a turbine housing having formed therein an inlet passage for receiving exhaust gases from an engine, a volute passage

for guiding the exhaust gases from the inlet passage into driving communication with a turbine wheel, an outlet opening, an exducer passage for guiding the exhaust gases from the turbine wheel to the outlet opening, and a bypass passage communicating between the inlet and exducer passages, said bypass passage having an outlet aperture oriented to open into said exducer passage generally in a downstream-facing direction; and

a wastegate valve including a disk-shaped valve head carried by said turbine housing for selectively opening and closing said bypass passage outlet aperture to flow of exhaust



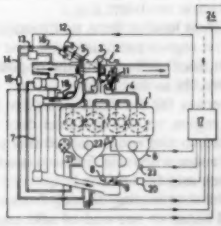
gases, said valve head being movable about a pivot axis disposed generally within said exducer passage at a position generally between said bypass passage outlet aperture and said turbine wheel for movement of said valve head between a closed position oriented generally perpendicular to a central axis of said bypass passage outlet aperture and an open position in an orientation approaching parallelism with the bypass passage outlet aperture central axis whereby said valve head substantially avoids blockage of exhaust gases flowing through said bypass passage outlet aperture.

4,463,565

TURBOCHARGED INTERNAL COMBUSTION ENGINE WITH BOOST PRESSURE AND IGNITION TIMING CONTROL FOR PREVENTING KNOCKING COMBUSTION

Jan E. Rydquist, Billdal; Lars Sandberg, Gothenburg, and Ralf Wallin, Lindome, all of Sweden, assignors to AB Volvo, Gothenburg, Sweden

Filed Feb. 16, 1982, Ser. No. 348,723
Claims priority, application Sweden, Feb. 19, 1981, 8101119
Int. Cl.³ F02B *37/12*
U.S. Cl. 60—602 **6 Claims**



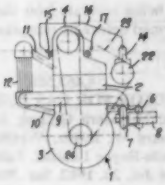
1. In a system for preventing knocking combustion in a turbocharged Otto engine, said system including means controlling the charge pressure and means controlling engine ignition timing, comprising a knock detector mounted on the engine block and signal processing means disposed to receive signals sent from the detector and to send control signals dependent thereon to said means controlling the charge pressure, said signal processing means being arranged upon receiving signals indicating knocking of a certain intensity to send signals to said means controlling the charge pressure to reduce the charge pressure; the improvement in which the signal processing means are disposed to send signals to said means controlling engine ignition timing to retard engine ignition timing in combination with the reduction of the charge pressure.

4,463,566

INTERNAL COMBUSTION ENGINE

Enzo Guidoboni; Paolo Guidoboni, and Sergio Guidoboni, all of Bologna, Italy, assignors to Laerte Guidoboni, Bologna, Italy

Filed Apr. 29, 1982, Ser. No. 373,284
Claims priority, application Italy, Apr. 29, 1981, 3414 A/81
Int. Cl.³ F02B *37/00*
U.S. Cl. 60—605 **12 Claims**



1. An internal combustion engine for generating a stratified mixture in a combustion chamber with the richness of the mixture progressively increasing towards the ignition point, comprising:

a reciprocating motion means including at least one piston and a cylinder head housing the ignition point and at least two inlet valves communicating with a pressurized inlet duct of Venturi-tube shape adjacent a first end of said cylinder; an exhaust port arranged along a semicircumference of said cylinder adjacent a second, opposite end, said exhaust port communicating with an exhaust manifold and a scavenging port housed along a circumferential arch located in the cylinder housing substantially opposite said exhaust port adjacent said second end, said scavenging port communicating with a pressurized duct of scavenging air; and

a rotating motion means including a gas turbine coupled to a compressor means, said compressor means having the air outlet thereof connected to an inlet and scavenging manifold; said inlet and scavenging manifold being connected directly to said scavenging duct and through a heat exchanger to said inlet duct so as to maintain the same pressure in both said scavenging and inlet ducts;

said reciprocating motion means performing the high pressure portion of the thermodynamic cycle and said rotating motion means performing the low pressure portion of the thermodynamic cycle such that one thermodynamic cycle is completed with each piston stroke.

4,463,567

POWER PRODUCTION WITH TWO-PHASE EXPANSION THROUGH VAPOR DOME

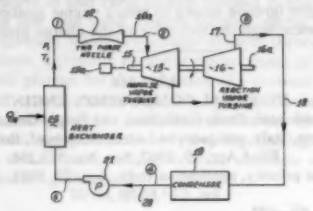
William E. Amend, Rolling Hills Estates, and Stephen J. Toner, Los Angeles, both of Calif., assignors to Transamerica Delaval Inc., Lawrenceville, N.J.

Filed Feb. 16, 1982, Ser. No. 348,817
Int. Cl.³ F01K *25/00*
U.S. Cl. 60—671 **7 Claims**

1. In a system wherein a fluid exhibits a regressive vapor dome in a T-S diagram, the combination comprising

(a) a two-phase nozzle receiving said fluid in a pressurized and heated liquid state and expanding said received liquid into a saturated or superheated vapor state in a vapor jet, and

(b) turbine means receiving only said saturated or superheated vapor in jet form to convert the kinetic energy thereof into power,



(c) said nozzle being separate from the turbine means so that said jet is formed before its reception in the turbine means.

4,463,568

FUEL INJECTOR FOR GAS TURBINE ENGINES

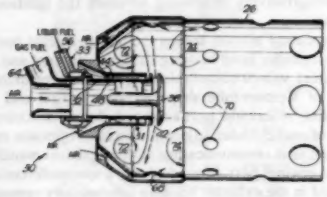
Jeffrey D. Willis, Earnsford Grange; Arthur B. Griffin, Burbage, and Bernard W. Boyce, Weddington, all of England, assignors to Rolls-Royce Limited, London, England

Filed Jul. 20, 1982, Ser. No. 400,224

Claims priority, application United Kingdom, Jul. 28, 1981, 8123208

Int. Cl.³ F02C 7/22

U.S. Cl. 60—742 2 Claims



1. A dual fuel injector for a gas turbine engine having a casing with a compressor, combustor means capable of promoting therein a first upstream toroidal vortex and a second downstream toroidal vortex, and a turbine arranged in flow series within the casing, said fuel injector comprising:

a passageway assembly attached to said combustor means, said passageway assembly including a central duct having open upstream and downstream ends, a first deflecting member positioned downstream of said downstream end of said central duct and forming therewith a first annular generally radially directed outlet, a shroud member extending at least partially along the length of said central duct and forming therewith an annular duct concentric of said central duct, said annular duct having open upstream and downstream ends, a second deflecting member carried on the downstream end of said central duct and spaced downstream of said downstream end of the shroud member and forming therewith a second annular generally radially directed outlet upstream of said first outlet;

a sapply of compressed air from said compressor for continuous delivery to said central duct and to said annular duct; and

a fuel injector assembly attached to said casing, said fuel injector assembly being detachably arranged with respect to and cooperating with said passageway assembly for seleetively providing liquid fuel and gaseous fuel thereto, said fuel injector assembly including inner fuel ducting for gaseous fuel and outer fuel ducting for liquid fuel, said inner fuel ducting terminating in an annular outlet upstream of and aligned with said upstream end of said central duct for supplying gaseous fuel thereto for mixing with compressed air therein to be discharged as an air/gaseous fuel mixture radially through said first outlet while compressed air only is discharged from said second outlet, and said outer fuel ducting including a liquid fuel manifold having a plurality of liquid fuel outlets communicating with said annular duct adjacent to said upstream end thereof for supplying liquid fuel thereto for mixing with compressed air therein to be discharged as an air/liquid fuel mixture through said second outlet into said first toroidal vortex while compressed air only is discharged radially through said first outlet thereby tending to maintain said air/liquid fuel mixture upstream thereof in said first toroidal vortex and to prevent deposition of carbon on said first deflecting member.

4,463,569

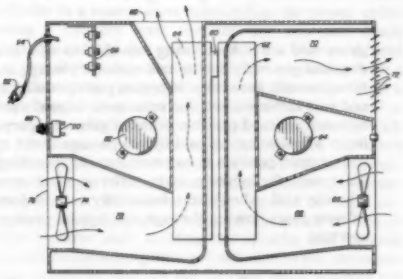
SOLID-STATE HEATING AND COOLING APPARATUS

Gerald E. McLarty, 3010 E. Desert Cove, Phoenix, Ariz. 85028

Filed Sep. 27, 1982, Ser. No. 423,865

Int. Cl.³ F25B 21/02

U.S. Cl. 62—3 11 Claims



1. A solid state heating and cooling apparatus for controlling the temperature of a room, comprising:

at least one thermoelectric module having first and second sides, said first and second sides being hot and cold respectively when current passes through said module in a first direction and becoming cold and hot respectively when said current passes through said module in a second opposite direction, said thermoelectric module including a first air conduit region proximate said first side and a second air conduit region proximate said second side;

first means for supplying said current to said at least one thermoelectric module;

a first inlet duct leading from said room directly to one end of said first region proximate said first side;

a first outlet duct leading from the opposite end of said first region directly to said room;

a first fan means for causing air to flow from said room to said first region via said first inlet duct and from said first region back to said room via said first outlet duct so as to cool said room when said first side is cold and to heat said room when said first side is hot;

a second inlet duct leading directly from a remote area apart from said room to one end of said second region proximate said second side;

a second outlet duct leading directly from the opposite end of said second region to a area apart from said room;

a second fan means for causing waste air to flow into said second inlet duct, past said second region and out said second outlet duct; and

second means for reversing the direction of current flowing through said at least one thermoelectric module for selectively heating and cooling said room for mainting a desired temperature therein.

4,463,570
METHOD OF DETERMINING A SET POINT FOR A TEMPERATURE PRESSURE CONTROLLER OF A HEAT PUMP

Alexander Kantner, Remscheid, Fed. Rep. of Germany, assignor to Joh. Vaillant GmbH

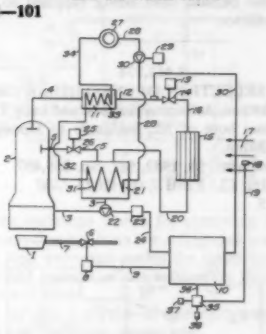
PCT No. PCT/DE82/00060, 371 Date Sep. 30, 1982, 102(e) Date Sep. 30, 1982, PCT Pub. No. WO82/03267, PCT Pub. Date Sep. 30, 1982

PCT Filed Mar. 12, 1982, Ser. No. 438,892

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1981, 8107912[U]; Feb. 17, 1982, 8205716[U]

Int. Cl.³ F25B *15/00*

U.S. Cl. 62—101 **4 Claims**



1. A method of determining the set point of a pressure/temperature controller for the high-pressure part of a sorption heat pump, the controller includes a pressure-temperature sensor as a measurement generator and a fuel valve and a solvent pump as control elements, comprising the steps of establishing the maximum power to be delivered by the sorption pump to a consumer, preadjusting the sorption heat pump to operate at the maximum power based on the lowest outdoor temperature established for the given climatic zone in which the pump operates, establishing a linear proportional characteristic curve with one end of the curve determined by the maximum power at the lowest outdoor temperature and the other end determined by zero power for a given temperature above the lowest outdoor temperature, sensing the outdoor temperature, converting the sensed temperature to nominal pressure/temperature value for the controller based on the linear curve and controlling the power delivered by the sorption heat pump via the controller as determined by the outdoor temperature.

4,463,571
DIAGNOSTIC MONITOR SYSTEM FOR HEAT PUMP PROTECTION

John W. Wiggs, 5001 E. 68th, Suite 500, Tulsa, Okla. 74136

Filed Nov. 6, 1981, Ser. No. 318,695

Int. Cl.³ F25B *49/00*

U.S. Cl. 62—126 **7 Claims**

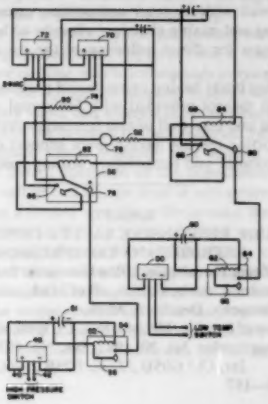
1. A method for monitoring protective circuitry for a heat pump system, wherein said circuitry involves activating a lock-out relay in response to a warning signal originating from either a high pressure switch or a low temperature switch thus terminating current to the compressor motor of said heat pump system, comprising the steps of:

(a) sensing the operation of said high pressure switch when said high pressure switch creates said warning signal that activates said lock-out relay terminating current to said compressor motor;

(b) supplying power to an electrical circuit, in response to sensing the event of step (a), that identifies said high pressure switch as having created said warning signal;

(c) sensing the operation of said low temperature switch when said low temperature switch creates said warning signal that activates said lock-out relay terminating current; and

(d) supplying power to an electrical circuit, in response to said sensing of the event of step (c), that identifies said low temperature switch as having created said warning signal,



thus discriminating between the high pressure switch and the low temperature switch as the source of the signal that activated said lock-out relay.

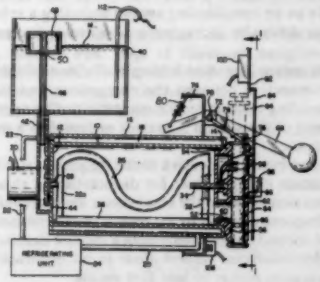
4,463,572
SOFT ICE CREAM MACHINE

E. Vernon Brown, Jr., Portland, Oreg., assignor to Glacier Products, Inc., Portland, Oreg.

Filed Nov. 19, 1982, Ser. No. 443,021

Int. Cl.³ A23G *9/00*

U.S. Cl. 62—135 **2 Claims**



2. A soft ice cream machine comprising

a freezing barrel having front, rear and enclosing side walls with an interior surface defining a freezing and mixing chamber,

an inlet adjacent the rear wall of said freezing barrel for admitting mix into said chamber,

an outlet valve in the front wall of said freezing barrel for dispensing ice cream,

at least one mixing blade in said barrel for mixing said ice cream and forcing it from said outlet valve,

a cooling chamber associated with at least a portion of said freezing barrel,

refrigerating means associated with said cooling chamber for cooling the freezing barrel,

and temperature sensing means supported on said front wall controlling the operation of said refrigerating means to

cause operation of the latter at a selected sensing temperature,

said temperature sensing means comprising a hollow rod-like projection with inner and outer end portions and enclosing a sensor,

said projection leading from its inner end portion from said front wall with its outer end portion extending into said freezing and mixing chamber whereby to be embedded in ice cream for direct influence of the ice cream on said sensor,

said mixing blade having opposite end portions with one end portion thereof provided with horizontal axis pivot support on said rear wall of said freezing barrel and the other end portion thereof having pivot support on the rod-like projection of said temperature sensing means.

4,463,573

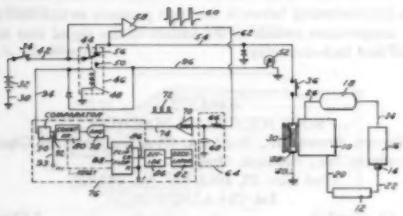
PRESSURE RESPONSIVE SAFETY CONTROL FOR REFRIGERANT COMPRESSOR

Robert V. Zeno, Farmington Hills; George A. Lutz, Ann Arbor, and Jayendra J. Amin, Canton, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 186,946, Sep. 15, 1980, abandoned. This application Jul. 30, 1982, Ser. No. 403,442

Int. Cl.[3] **G05D** *23/32;* **F25B** *27/00*

U.S. Cl. 62—157 **2 Claims**



1. In an air conditioning system including a refrigerant compressor driven by an engine, a compressor protector comprising:

first means for establishing and disestablishing a driving connection between the compressor and the engine according to whether the magnitude of an operating parameter of the system is greater or less than a predetermined value;

second means responsive to the frequency at which said first means changes state for disestablishing the driving connection between the compressor and the engine when said frequency equals or exceeds a predetermined frequency;

said second means comprising a current detector for sensing discontinuous current flow in an electrical circuit that supplies power to said first means;

comparator means for comparing the number of occurrences of current flow in the electrical circuit during a specific period of time to a predetermined number;

means for disestablishing the driving connection between the compressor and the engine when the number of occurrences of current flow equals or exceeds the predetermined number;

said comparator means including:

an oscillator producing a pulsetrain having a constant frequency;

a flip-flop set to the ON state for the period of the pulsetrain produced by said oscillator;

an AND gate having one input terminal connected to the output of said current detector and a second input terminal connected to the output of said flip-flop whereby said gate is open for the period of said flip-flop output pulsetrain;

a counter adapted to incrementally count the number of pulses received from the output of said AND gate during discrete periods when said gate is open;

a comparator adapted to produce a signal when the pulse count received from said binary counter attains a predetermined value, the signal operating to disestablished the driving connection between the compressor and the engine;

said current detector further including a zero crossing detector for converting the output waveform of said current detector to an undirectional pulsetrain which is supplied to said AND gate; and a low-pass filter for eliminating noise from the output signal of said current detector, the output signal of said filter being supplied to said zero crossing detector.

4,463,574

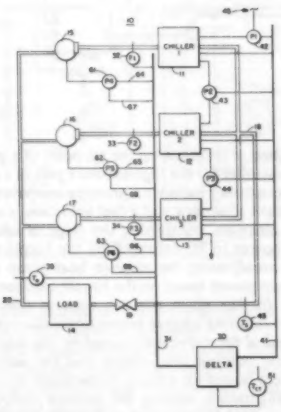
OPTIMIZED SELECTION OF DISSIMILAR CHILLERS

Donald H. Spethmann, Arlington Heights, and Lucy T. Y. Emerson, Barrington, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 15, 1982, Ser. No. 358,497

Int. Cl.[3] **F25B** *7/00;* **H02J** *1/00*

U.S. Cl. 62—175 **21 Claims**



1. A system for meeting building air conditioning load conditions by optimally selecting a combination of chillers, said chillers providing a supply of chilled water to said building and for receiving return water, said system comprising:

load sensing means for sensing building load;

refrigerant head sensing means for sensing refrigerant head of said chillers; and,

control means connected to said load sensing means and to said refrigerant head sensing means for sorting said chillers according to their efficiency characteristic curves with the chiller having a minimum kw/ton versus capacity point being ranked first and for selecting a combination of said chillers which will require a minimum energy input to meet building load conditions.

4,463,575

VAPOR GENERATING AND RECOVERY APPARATUS INCLUDING A REFRIGERANT SYSTEM WITH REFRIGERANT HEAT REMOVAL MEANS

James W. McCord, 9101 Nottingham Pkwy., Louisville, Ky. 40222

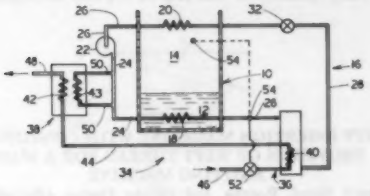
Filed Sep. 28, 1982, Ser. No. 425,165

Int. Cl.[3] **F25B** *39/04;* **B01D** *3/42*

U.S. Cl. 62—184 **12 Claims**

1. In a vapor generating and recovery apparatus for vaporiz-

ing a liquid and condensing a vapor, including at least one chamber for containing the liquid and vapor, a heating and cooling system in heat transfer relation with the liquid and the vapor in the at least one chamber, the heating and cooling system including a refrigerant condensing coil in heat emitting relationship with the liquid, a refrigerant evaporator coil in heat absorbing relationship with the vapor and a refrigerant compressor having the high pressure side in refrigerant flow communication with the condensing coil and the low pressure side in refrigerant flow communication with the evaporator coil, the improvement comprising:



a first heat exchange means for removing heat from the refrigerant flowing from the refrigerant condensing coil;

a second heat exchange means for removing heat from a preselected amount of the refrigerant flowing from the compressor; and,

means to by-pass a portion of said refrigerant around said second heat exchange means; and,

means for activating the first and second heat exchange means for maintaining a predetermined heat absorbing relationship between the refrigerant evaporator coil and the vapor.

4,463,576

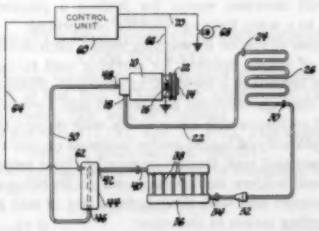
SOLID STATE CLUTCH CYCLER WITH CHARGE PROTECTION

Dale E. Burnett, Lebanon; Mervin R. Butts, West Milton, and Paul E. Trissel, Dayton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 189,062, Sep. 22, 1980, abandoned. This application Sep. 27, 1982, Ser. No. 424,464

Int. Cl.³ F25B *49/00*; G05D *23/19*

U.S. Cl. 62—228.3 **2 Claims**



1. In an automotive air conditioning system including an evaporator in which liquid refrigerant is vaporized in effecting heat exchange with a compartment to be cooled, means including a compressor for drawing refrigerant vapor from the evaporator outlet and for supplying refrigerant to the evaporator inlet, the quality of the supplied refrigerant being related to the refrigerant charge level in the system such that the supplied refrigerant is predominantly liquid when the refrigerant charge is at a normal level and predominantly vapor when the refrigerant charge is at an abnormally low level which is insufficient to provide adequate compressor lubrication, and means including a transducer for cycling the compressor on and off according to the pressure of the refrigerant vapor between the evaporator outlet and the compressor such that the compressor is cycled on when such pressure rises above an upper reference value due to vaporization to refrigerant in the evaporator and the compressor is cycled off when such pressure decreases below a lower reference value due to the drawing action of said compressor, the improvement comprising:

sensing means for monitoring the compressor on-time and for signalling the occurrence of an on-time at least as short as a reference on-time which corresponds to system operation wherein the refrigerant supplied to said evaporator is predominantly vapor and wherein the compressor thereby rapidly reduces the pressure of the refrigerant vapor to the lower reference value, whereby said sensing means is effective to detect operation of the compressor with an insufficient refrigerant charge level in said system without necessitating a further transducer for sensing the refrigerant charge level; and

means for counting the number of consecutive cycles for which said sensing means signals the occurrence of an on-time at least as short as said reference on-time and for disabling the compressor when the count reaches a number indicative of a predetermined probability that the amount of refrigerant is insufficient for continued safe operation.

4,463,577

FLAT KNITTING MACHINE HAVING A PRESSER FOOT DEVICE

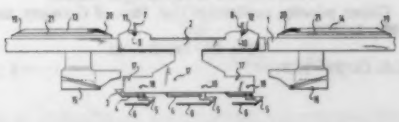
Reinhold Schimko, Aalen-Wasseralfingen, and Josef Köninger, Westhausen, both of Fed. Rep. of Germany, assignors to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co., Westhausen, Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,842

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1981, 3104533

Int. Cl.³ D04B *7/04*

U.S. Cl. 66—64 **6 Claims**



1. A flat knitting machine comprising thread guide rail means adapted to extend along the axis of the needle beds, separate slider means mounted for reciprocating sliding movement on said guide rail means, entraining means adapted to be carried by the carriage of the knitting machine for selective shifting into and out of engagement with said separate slider means for entraining said separate slider means for movement with said carriage in opposite directions, presser foot wires having free trailing end portions adapted to extend in the direction of travel of the carriage in front of the withdrawal position of the needle, holder means supporting said presser foot wires mounted on said separate slider means for vertical sliding movement towards the needle bed combs.

4,463,578

SINGLE OR MULTIPLE CAM UNIT FOR KNITTING MACHINES

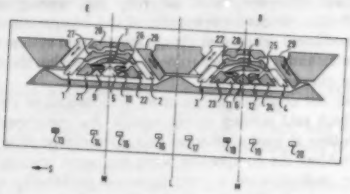
Reinhold Schimko, Aalen-Wasseralfingen; Albert Lutz, Westhausen, and Gottfried Kühnert, Aalen, all of Fed. Rep. of Germany, assignors to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG, Westhausen, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 422,492

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138986

Int. Cl.³ D04B *7/00*

U.S. Cl. 66—75.1 **2 Claims**



1. In a multiple cam unit for a knitting machine in which the feet of the knitting needles are selectively lowerable in channels of the needle beds by means of a needle selector device, the cam units comprising fixed and movable cam elements and also pressure cam elements which co-operate with the needle selector device, wherein in combination

(a) each cam unit is symmetrical about a central axis as known per se and has a first cam element symmetrical with respect to said central axis which is oscillatable in the cam plane for advancing the needles in knit-stitch formation,

(b) each cam unit has a second cam element symmetrical with respect to said center axis which is controllable for tuck-stitch formation,

(c) fixed transfer cam elements and fixed acceptor cam elements as well as controllable transfer and acceptor cam elements for effecting stitch transfer are provided in each cam unit, and

(d) each cam unit has at least two pressure cam elements per needle bed and per carriage traverse direction.

4,463,579

DOUBLE CAM UNIT FOR KNITTING MACHINES

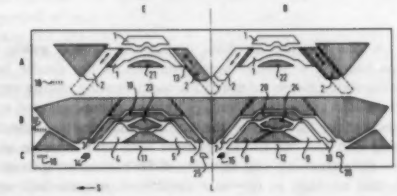
Reinhold Schimko, Aalen-Wasseralfingen, and Gottfried Kühnert, Aalen, both of Fed. Rep. of Germany, assignors to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG, Westhausen, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 422,503

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138981

Int. Cl.³ D04B *7/00*

U.S. Cl. 66—75.1 **5 Claims**



1. A double cam unit for a knitting machine including a Jacquard device having jacks arranged in the needle channels of the needle beds behind the knitting needles, with needle cam units and jack cam units with fixed and movable cam elements arranged in three levels under one another, the cam units being symmetrical about the central line between the two parts of the double cam unit, wherein a jack cam unit level and a Jacquard cam unit level are provided under a needle cam unit level, each needle cam unit is provided with a transfer cam element movable in longitudinal direction of the needles and being symmetrical with respect to a cam cross axis, each jack cam unit is provided with two movable acceptor cam elements for stitch transfer being symmetrical with respect to a cam cross axis, and each jack cam unit is provided with a movable cam element for bringing into actuation all nonselected working jacks and being symmetrical with respect to a cam cross axis.

4,463,580

WEFT INSERTION MAGAZINE WITH CONTINUOUS PROVISION OF WEFT THREAD FOR A WARP KNITTING MACHINE

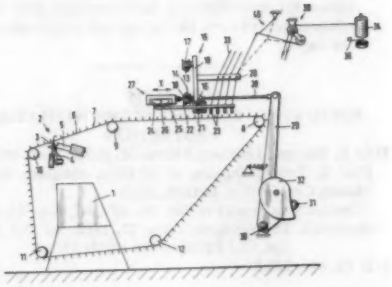
Gerhard Hittel, Rodgau, and Johann Fiedler, Obertshausen, both of Fed. Rep. of Germany, assignors to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Sep. 1, 1982, Ser. No. 413,698

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136181

Int. Cl.³ D04B *23/06*

U.S. Cl. 66—84 A **8 Claims**



1. Weft insertion means for feeding a plurality of weft threads to a warp knitting machine comprising:

(a) a pair of spaced forwarding means, each having a plurality of spaced holders, for carrying weft threads held on said holders in a forward, longitudinal direction;

(b) a carriage mounted adjacent to said forwarding means and reciprocatable transversely with respect thereto;

(c) a plurality of thread guides mounted on said carriage for laying said weft threads in parallel about respective ones of said holders, said carriage and guides being operable to transport said weft threads from one of said pair of forwarding means to the other;

(d) a plurality of spools for delivering tangentially and untwisted from each, one of said weft threads, the threads on said spools comprising flat, untwisted ribbons, each of said spools being mounted to rotate about its spool axis; and

(e) a delivery arrangement having a drive roller for pulling the weft threads from said spools, said drive roller being operable to rotate at a constant tangental speed equivalent to the mean rate of consumption of weft thread by said knitting machine;

(f) weft thread storage means for engaging said threads between said spools and said thread guides and for compensating for the periodically varying rate of consumption against the continuous delivery of the weft threads.

4,463,581
KNITTING PROCESS AND MACHINE

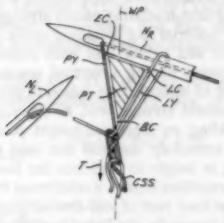
Reinhards Vitols, Tollerton; Steven Walkinshaw, and Gordon R. Wray, both of Loughborough, all of England, assignors to National Research Development Corporation, London, England

Filed Jan. 29, 1982, Ser. No. 344,035

Claims priority, application United Kingdom, Jan. 29, 1981, 8102718

Int. Cl.³ D04B *23/02*

U.S. Cl. 66—87 **35 Claims**



1. A knitting process in which

a first yarn is fed through an eye of a first needle and a second yarn is fed through an eye of a second needle, links are formed by the first needle being moved relatively to the second needle so that its eye passes between the second needle and a section of the second yarn, and the second needle being withdrawn so that the second yarn forms a loop on the first needle, after which the second needle is moved relatively to the first so that its eye passes between the first needle and the first yarn, the first needle then being retracted so that

(a) the said loop is cast off the first needle and

(b) the first yarn forms a loop on the second needle this process being repeated to form successive links between the cast off loops,

the needles reciprocating at least principally lengthwise of themselves, a pick-up triangle being formed between needle, loop and yarn having a base corner where the yarn and the loop meet at the last-formed link, and

the base corner position is mechanically controlled with respect to the needle to ensure link formation.

4,463,582
APPARATUS FOR SUPPLYING DETERGENT CONCENTRATE

Günter Saalmann, Gevelsberg, and Richard Haslberger, Hallabruck, both of Fed. Rep. of Germany, assignors to Lang Apparatebau GmbH, Fed. Rep. of Germany

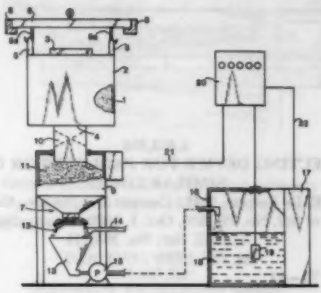
Division of Ser. No. 371,132, Apr. 23, 1982. This application May 27, 1983, Ser. No. 498,693

Claims priority, application Fed. Rep. of Germany, May 31, 1981, 3118973

Int. Cl.³ D06F *39/02*

U.S. Cl. 68—17 R **2 Claims**

1. An apparatus for supplying measured amounts of water soluble or water insoluble powdered or granular detergent concentrate to a commercial washing machine or laundry which comprises a delivery container containing detergent concentrate and having a flexible, tubular, closable emptying means for said delivery container, a storage means in a metering device, and means for attaching a suspending means to the delivery container to position the delivery container above the storage means, wherein the closable emptying means is connected to the storage means in a substantially dust-tight manner by means of a channel extending from the bottom of the delivery container to the top of the storage means, the spatial relationship between the delivery container and the storage means being such that the detergent concentrate is gravity fed through the channel to the storage means; the metering device comprises a rotating disk upon which detergent concentrate from the storage means falls and a flushing hopper situated below the rotating disk where water is added from a water supply to detergent concentrate falling from the rotating disk, the metering device supplying detergent concentrate and



water at a predetermined concentration which is a pumpable mixture, said mixture being conveyed into the commercial washing machine or laundry by means of a pump; and the metering device, pump, and water supply are activated in response to changes in a predetermined value in the electrical conductance of the wash water in the commercial washing machine or laundry.

4,463,583
APPARATUS FOR APPLYING FOAM

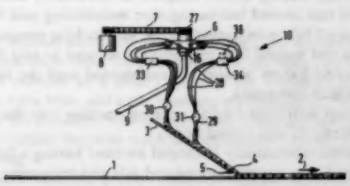
Max Krüger, Krefeld, and Manfred Moser, Krefeld-Fischeln, both of Fed. Rep. of Germany, assignors to Eduard Küsters, Krefeld-Forstwald, Fed. Rep. of Germany

Filed May 3, 1982, Ser. No. 374,059

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1981, 3131545

Int. Cl.³ D06B *1/06*

U.S. Cl. 68—205 R **15 Claims**



1. In an apparatus for applying foam onto continuously advancing webs of material from several nozzles, the improvement comprising at least one foam distributor, said distributor including:

(a) a stationary housing forming a chamber;

(b) a plurality of spaced foam outlets at the periphery of said chamber, individual ones of said foam outlets coupled to said nozzles;

(c) a feed line for foam;

(d) a rotor, supported for rotation in said chamber, having an inlet in communication with said feed line, and at least one radial outlet aperture opening into said chamber to permit foam from said feed line to be directed into said chamber; and

(e) means for rotating said rotor, whereby foam will be

distributed in a direction toward different ones of said foam outlets as said rotor is rotated.

4,463,584

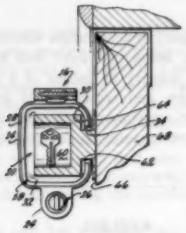
PROTECTING DEVICE FOR PADLOCKS OR OTHER SIMILAR LOCKS

William E. De Forrest, 10452 Courson Dr., Stanton, Calif. 90680

Division of Ser. No. 192,886, Oct. 1, 1980. This application Jun. 1, 1982, Ser. No. 384,151

Int. Cl.³ E05B 17/14, 65/52

U.S. Cl. 70—63 1 Claim



1. In a protection device of the type having first and second protector halves hingedly associated with each other, said first and said second halves joining together along a substantially planar junction, said halves when associated together along said planar junction substantially forming a hollow united body, said united body having a closed bottom wall and a substantially cylindrical circumferential wall, said body having a top wall, locking means adapted to releaseably secure said first and said second halves together maintaining said first and said second halves as a united body, said locking means including first and second lugs respectively secured to said first and said second halves on said circumferential wall the improvement which comprises:

said top wall including an opening opening into the hollow interior of said united body;

a unified substantially U-shaped member having a first elongated side, a second elongated side and transverse section connecting said first and said second elongated sides such that said first and said second elongated sides are substantially parallel to each other;

a bulbus member including a protruding section, said protruding section fixly connected to one of said first or said second elongated sides, the cross-sectional area of said protruding section sized and shaped to be smaller than said opening in said top wall such that said protruding section is capable of being located within said opening in said top wall when said sides are associated together along said planar junction forming said united body, the cross-sectional area of said bulbus member sized and shaped to fit within said body when said halves are associated together along said planar junction forming said united body and incapable of passing through said opening when said sides are associated together along said planar junction forming said united body.

4,463,585

HEAT SHIELD ARRANGEMENT FOR A ROLLING MILL

William R. Laws, 19 Tudor Ave., Worcester Park, Surrey, and Geoffrey R. Reed, 8 Beechdene, Tadworth, Surrey, both of England

Division of Ser. No. 91,752, Nov. 6, 1979, Pat. No. 4,343,168, which is a continuation-in-part of Ser. No. 902,560, May 3, 1978, abandoned. This application Feb. 22, 1982, Ser. No. 351,148

Claims priority, application United Kingdom, May 4, 1977, 18760/77; Apr. 27, 1978, 16704/78; Nov. 7, 1978, 43506/78

Int. Cl.³ B21B 43/00, 45/02

U.S. Cl. 72—10 8 Claims

1. A heat shield arrangement for a heated length of sheet material comprising heat-insulating panels arranged adjacent a travel path for the material and including series of upper and lower panels above and below said path respectively, said upper and lower panels having a vertical spacing of limited height along at least an intermediate region of the longitudinal extent of the heat shield arrangement, an entry region of the arrangement providing an increased-height passage for the introduction of a turned-up material and said entry region passage decreasing in height to lead into the limited vertical spacing of said intermediate region, a reinforced frame or plate structure forming at least part of said entry region, said structure comprising an upwardly displaceable element, means for applying a hold-down force for restraining the upward displacement of said element, and means for raising the upper insulating panels away from the material path arranged to be actuated by the displacement of said element against the force of said restraining means.

4,463,586

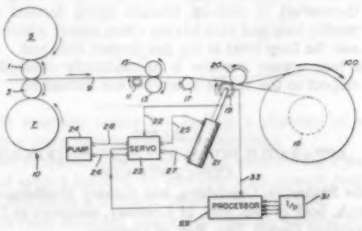
AUTO WRAP ANGLE/POSITIONER FOR SHAPE SENSING ROLL

Alan O. Griffin, Richmond, Va., assignor to Reycan Research Limited, Rexdale, Canada

Filed Apr. 13, 1983, Ser. No. 484,466

Int. Cl.³ B21B 37/04; B21C 47/00

U.S. Cl. 72—17 15 Claims



8. In a metal strip rolling apparatus consisting of a rolling mill, a tension take-up reel to receive the metal strip passing through the mill, and a shape sensing roll mounted between the mill and the take-up reel, the shape sensing roll providing information for adjusting the mill for correction of the shape of the metal strip in the mill, the improvement comprising:

means between said shape sensing roll and said take-up reel for maintaining a constant wrap angle of said metal strip on said shape sensing roll;

means for automatically adjusting actual wrap angle of the metal strip on the shape sensing roll, said means for automatically adjusting comprising:

hydraulic means, disposed at both ends of the shape sensing roll, for adjusting the position of both ends of the shape sensing roll simultaneously relative to the position of said take-up reel;

servo means for controlling the operation of said hydraulic means; and

processor means receiving information from said shape

sensing roll relating to said actual wrap angle and including in its memory a quantity indicative of a desired wrap angle;

said shape sensing roll and said hydraulic lift and said servo means and said processor means comprising closed loop;

whereby, when said actual wrap angle is different from said desired wrap angle, said processor will actuate said servo to control the hydraulic means to adjust the position of the shape sensing roll to eliminate said difference.

4,463,587

ARTICLE HANDLING ASSEMBLY FOR FORGING PRESSES HAVING A SPRAYING MECHANISM FOR CLEANING, LUBRICATING AND COOLING THE PRESS

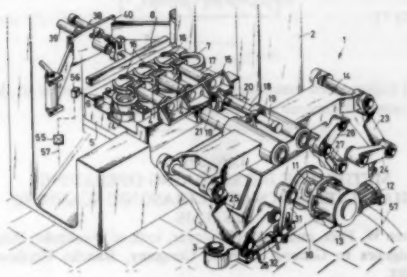
Eberhard Werner, Leverkusen, Fed. Rep. of Germany, assignor to Eumuco Aktiengesellschaft für Maschinenbau, Fed. Rep. of Germany

Filed Apr. 27, 1982, Ser. No. 372,411

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1981, 3116752

Int. Cl.³ B21J *3/00*

U.S. Cl. 72—43 **10 Claims**



1. An article handling assembly for a forging press having a plurality of work stations and a spraying mechanism for said work stations, said assembly comprising:

(a) plural workpiece grasping means for carrying workpieces,

(b) means for effecting movement of the plural workpiece grasping means sequentially along and outside of the work stations of the forging press and for moving the plural workpiece grasping means into and out of the work stations of the forging press,

(c) means for moving the spraying mechanism into the work stations of the forging press, and

(d) control means for effecting movement of the spraying mechanism into the work stations while the plural workpiece grasping means is located outside the work stations during the transport of workpieces from one work station to the next,

(e) said spraying mechanism is disposed adjacent to the work stations opposite to said plural workpiece grasping means and reciprocates toward and away from said work stations,

(f) said reciprocation motion of the spraying mechanism being synchronous and in opposite phase with respect to the movement of the plural workpiece grasping means into and out of the work stations of the forging press.

4,463,588

SKEWED-AXIS CYLINDRICAL DIE ROLLING

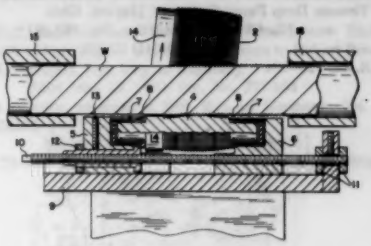
Howard A. Greis, 59 Banbury La., Holden, Mass. 01520

Filed Mar. 22, 1982, Ser. No. 360,398

Int. Cl.³ B21H *3/04*

U.S. Cl. 72—98 **10 Claims**

1. A skewed-axis cylindrical-die rolling machine for the production of continuous helical forms including roots and flanks and comprising at least two driven annular cooperating forming dies and a freely rotatable work support, said support



having a formed contour that contacts and supports a significant major portion of the flanks and roots of the threads of the helix being rolled.

4,463,589

INDIRECT EXTRUSION PRESS

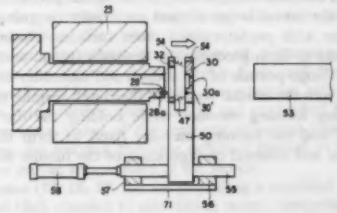
Akira Asari, Osaka; Tatsuhiko Noyori, Kobe; Takahisa Tabuchi, Kobe; Tsuneharu Masuda, Kobe, and Masao Mizoguchi, Shimonoseki; Tetsuro Takehata, deceased, late of Osaka, by Akimi Takehata, legal representative, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed May 4, 1982, Ser. No. 374,733

Claims priority, application Japan, Aug. 22, 1981, 56-125003; Mar. 1, 1982, 57-29384

Int. Cl.³ B21C *33/00, 35/06*

U.S. Cl. 72—273.5 **7 Claims**



1. An indirect extrusion press including a die assembly having a detachable loose die mounted on a die stem and axially movable relative to a billet container for extruding a billet through a die hole, and a die handling mechanism for transferring said die assembly between the press center and a retracted position outside the press machine, said indirect extrusion press comprising:

a reduced diameter portion provided in a rear end portion of said die stem and defining a stepped wall portion;

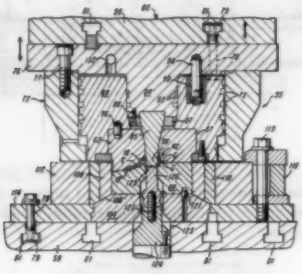
said detachable loose die mounted on an end face portion of said reduced diameter portion; and

a detachable cleaning ring loosely fitted on said reduced diameter portion of said die stem in abutting engagement with said stepped wall portion and in axially spaced relation with said detachable loose die to define a gap therebetween, the detachable cleaning ring being contacted with an inner peripheral portion of said container in the extruding phase of the operation to scrape off container shells therefrom which are received in said gap, and wherein said detachable cleaning ring and said detachable loose die are adapted to cooperate with said die handling mechanism so as to be detached by said die handling mechanism from said die stem and transferred to said retracted position outside the press machine.

4,463,590
FORGING METHOD

Donald L. Theobald, Kettering, Ohio, assignor to The Harris-Thomas Drop Forge Company, Dayton, Ohio

Filed Feb. 25, 1982, Ser. No. 352,191
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—354 12 Claims



1. An improved method of efficiently producing a non-symmetrical ball joint socket having a tubular socket porion and an integral mounting flange portion projecting laterally from one side of the socket portion, comprising the steps of heating a predetermined section of metal, progressively impacting the heated metal section with hot forging dies to form a rough forging having generally a tubular socket portion and a mounting flange portion projecting from one side of the tubular socket portion, inserting the rough forging into a die set including mating die members defining a cavity corresponding to the desired external configuration of the socket and surrounding a relatively movable punch and an axially opposing forming member with predetermined outer surfaces, closing the die members to form precisely the desired external configuration of the flange portion of the socket, and thereafter moving the punch into the tubular socket of the rough forging against the opposing forming member while holding the die members closed and the forming member fixed to form the desired internal and external configuration of the tubular socket portion.

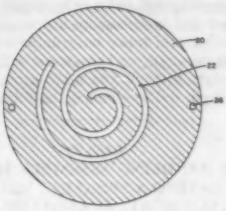
4,463,591
METHOD OF FABRICATING SCROLL MEMBERS BY COINING AND TOOLS THEREFOR

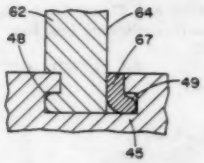
John E. McCullough, Carlisle, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Division of Ser. No. 239,564, Mar. 2, 1981, Pat. No. 4,403,494. This application Apr. 25, 1983, Ser. No. 488,469
Int. Cl.³ B21D *22/00, 31/00, 17/02*
U.S. Cl. 72—360 8 Claims

1. A method of fabricating a scroll member, comprising the steps of:

(a) providing a two-piece scroll member by separately forming an involute wrap and forming an end plate with an involute channel in the surface thereof; and assembling said scroll member by seating said involute wrap in said channel, said assembled two-piece scroll member having attained at least about 95 percent of the dimensional accuracy and finish required for the flank surfaces of said wrap and the contacting surfaces of said end plate; and



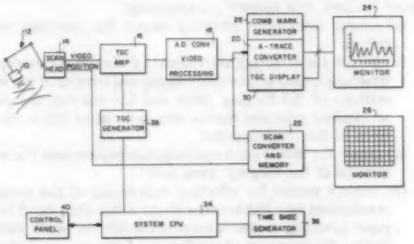


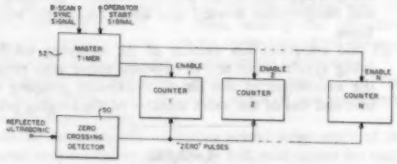
(b) coining said assembled two-piece scroll member to the required dimensional accuracy and finish.

4,463,592
METHOD OF DETERMINING OPERATING CHARACTERISTICS OF ULTRASONIC SCANNING SYSTEMS

Stephen W. Flax, and Gary H. Glover, both of Waukesha, Wis., assignors to General Electric Company, Rancho Cordova, Calif.

Filed Jul. 16, 1982, Ser. No. 398,815
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—1 DV 5 Claims





1. A method of characterizing frequency spectrum of an ultrasonic scanning system comprising the steps of

directing ultrasonic energy from said system into a phantom having known ultrasonic attenuation,

detecting the frequency of a reflected ultrasonic signal for various depths in said phantom,

determining the slope of frequency versus depth as a measure of band-width of the reflected signal,

determining center frequency of said system from the frequency of the reflected signal reflected from the surface of said phantom, and

determining frequency spectrum shape from the change in frequency of the reflected signal with change in depth in said phantom.

4,463,593

APPARATUS FOR MONITORING THE PARTIAL PRESSURE OF GASES

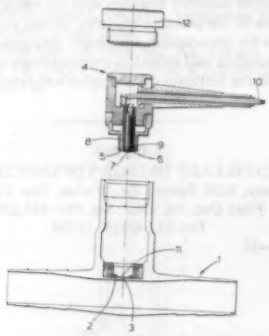
Dawood Parker, London, England, assignor to G. D. Searle & Co., Skokie, Ill.

Filed Nov. 6, 1981, Ser. No. 319,003

Claims priority, application United Kingdom, Nov. 11, 1980, 8036191

Int. Cl.³ G01N *27/54*

U.S. Cl. 73—19 **17 Claims**



1. An apparatus for monitoring the partial pressure of gas present in a liquid as it flows through a conduit, the apparatus comprising:

a connector for insertion in said conduit, said connector comprising:

(a) a substantially tubular passageway adapted for flow therethrough of the liquid whose partial gas pressure is to be monitored, said passageway being defined at least in part by a wall having an aperture therein,

(b) a membrane having a first face for contact with liquid in said passageway and a second oppositely disposed face; said membrane being impermeable to the liquid, but permeable to the gas whose partial pressure is to be monitored;

(c) perforated support means for supporting said membrane wherein said perforated support means contacts said membrane and extends across said aperture to permit said first face thereof to be contacted by the liquid as it flows through said passageway and past said aperture therein, and

(d) means for detachably receiving a removable sensor responsive to the gas that passes through said membrane from the liquid;

said apparatus also comprising a removable sensor responsive to gas passing through the membrane from the liquid;

whereby said sensor does not contact said liquid flowing in said passageway of said connector and need not be sterile; and can be removed from said connector and be reused.

4,463,594

WIDE-RANGE TEMPERATURE OPERATING SYSTEM FOR COMBUSTION GAS OXYGEN SENSOR, AND METHOD

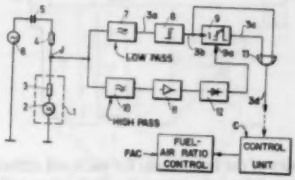
Lothar Raff, Remseck, and Hans-Martin Wiedenmann, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 13, 1982, Ser. No. 377,604

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1981, 3126238

Int. Cl.³ G01N *31/00*; F02B *3/08*

U.S. Cl. 73—23 **20 Claims**



1. System for determination of the oxygen content in gases, especially the exhaust gases from a combustion process, and particularly from an internal combustion engine, having

an oxygen sensor (1) furnishing a sensed output signal varying between two values in dependence on oxygen content of the gas, and wherein the change in value, with respect to oxygen content, is dependent on operating temperature of the sensor, comprising

threshold means (8) responding to the level of the sensed output signal of the sensor and providing discrete output signals (3*b*, 5*b*) representative of the sensed output signal;

temperature signal generating means (4, 5, 6, 10, 11, 12) providing a temperature output signal representative of temperature of the sensor;

at least one controllable timing stage (9, 14) connected to receive the discrete output signals from said threshold means (8) and having a variable time constant, said timing stage being further connected to and controlled by said temperature signal of the temperature signal generating means, for varying the time constant thereof in dependence on the temperature of the sensor;

and means (13; 16, 19, 22) for providing a modified output signal (3*d*), coupled to said timing means, comprising

combining means (13, 16; 17) combining an output signal (3*c*, 5*c*) from the timing stage (9, 14) with the discrete output signals (3*b*, 5*b*) to provide said modified output signal (3*d*, 5*d*).

4,463,595

PARALLEL FLOW DIFFUSION BATTERY

Hsu-Chi Yeh, and Yung-Sung Cheng, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 16, 1983, Ser. No. 466,992

Int. Cl.³ G01N *15/02*

U.S. Cl. 73—28 **9 Claims**

1. A parallel flow diffusion battery for determining the mass size distribution of an aerosol, said battery comprising:

an intake manifold having input means for input of an aerosol and an output end;

a cell holding surface extending across and sealing the output end of said intake manifold; and

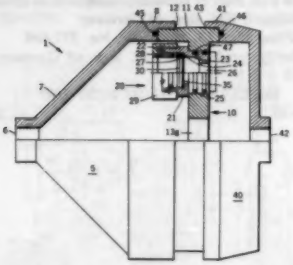
a plurality of diffusion cells affixed to said surface, each cell comprising:

a tubular body having an inner surface and an outer surface, said outer surface extending through and sealing a hole in said holding surface;

collimated hole means for diffusing an aerosol, said means

extending across and sealing the inner surface of said body; and

filter means for collecting all aerosol passing through said hole structure;



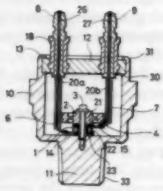
the density of the hole means for each cell differing from the density of the hole means for each other cell, whereby a plurality of measurements are simultaneously taken from each aerosol sample.

4,463,596

KNOCK SENSOR FOR COMBUSTION ENGINES

Masamitsu Asakura, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 12, 1982, Ser. No. 338,865
Claims priority, application Japan, Jan. 21, 1981, 56-6335
Int. Cl.³ G01L *23/22*
U.S. Cl. 73—35 **9 Claims**



1. In a knock sensor for an internal combustion engine comprising:

a housing mounted on a body of an internal combustion engine;

a vibration portion which is accommodated in said housing and which has a vibration unit that resonates at a knocking frequency of the internal combustion engine;

a converter element which converts a compression force into electric signals; and

a force which is generated at said vibration unit to said converter element as a compression force, wherein said vibration unit consists of a thin flange portion formed around the periphery of said weight and a thick ring portion formed around said thin flange portion.

4,463,597

APPARATUS FOR SEALING A PIPELINE

Aaron E. Pierce, Humble, and Wynn P. Rickey, Houston, both of Tex., assignors to Exxon Production Research Co., Houston, Tex.

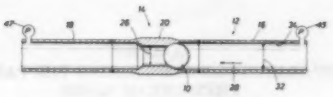
Continuation-in-part of Ser. No. 194,737, Oct. 7, 1980, abandoned. This application Feb. 2, 1983, Ser. No. 463,217
Int. Cl.³ G01M *3/28*
U.S. Cl. 73—40.5 R **15 Claims**

1. A pipeline pressure sealing and separation system, said system comprising:

a pipeline, having at least two sections, adapted for the transport of a fluid thereby and being substantially impediment free;

a first integral annular member adapted to be positioned between the first and second sections of the pipeline, said annular member having an inner protruding portion with a lip surface;

a spherical member adapted for substantial longitudinal movement by pressure-induction along the interior of the pipeline and capable of contacting said lip surface, said lip surface being curved at a radius of curvature substantially the same



as the radius of curvature of said spherical member so that upon engagement of said spherical member with said lip surface, a pressure-tight seal separates the first and second sections of the pipeline;

pump means for pressurizing one section of said pipeline once said spherical member engages said lip surface to enable a verification of the pressure integrity of said one section; and

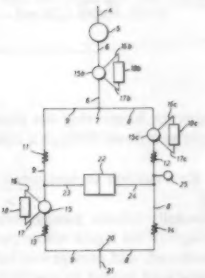
pump means for introducing a pressure differential across said seal to disengage said spherical member from said lip surface and permit the retrieval of said spherical member from said pipeline.

4,463,598

CAPILLARY BRIDGE VISCOMETER

Max A. Haney, 1030 Russell Dr., Porter, Tex. 77365

Filed Dec. 10, 1982, Ser. No. 448,525
Int. Cl.³ G01N *11/04*
U.S. Cl. 73—55 **18 Claims**



15. A process for independently measuring two parameters of multiple fractions of a solvent soluble polymer which consists essentially of;

(a) depositing fractions of a solvent soluble polymer on a gel permeation chromatographic column;

(b) eluting said polymer from the column of (a) with an eluting solvent;

(c) feeding the eluant of (b) through a first detector which continuously measures a property indicative of a solute polymer property;

(d) continuously feeding the eluant exiting the first detector to a capillaary bridge viscometer including,

(i) a first fluid flow circuit containing two capillaries in series, said first circuit being filled with eluting solvent;

(ii) a second fluid flow circuit containing, in sequence from the inlet,

(aa) a first capillary,

(bb) a liquid reservoir having a liquid volume substan-

tially larger than the volume of the said first capillary, and

(cc) a second capillary, liquid reservoir said second circuit being filled with eluting solvent; and

(e) during step (d);

(i) measuring the guage pressure in the viscometer at any point upstream of the second capillary in either the first or second fluid flow circuit, and

(ii) measuring the differential pressure existing between a point intermediate of the first and second capillaries in the first fluid flow circuit and a point intermediate of the first and second capillaries of the second fluid flow circuit.

4,463,599

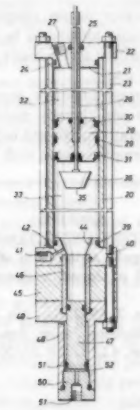
FREE WATER VOLUME ANALYZER

Robert H. Welker, Sugar Land, Tex., assignor to Welker Engineering Company, Sugar Land, Tex.

Filed Feb. 28, 1983, Ser. No. 470,311

Int. Cl.³ G01N *1/10, 33/26;* E21B *49/00*

U.S. Cl. 73—61.1 R **10 Claims**



1. Sample collection apparatus comprising:

(a) an elongate cylindrical housing;

(b) a head closing said housing at an upper end;

(c) piston means within said housing below said head and sealing within said housing for movement therein, said piston means dividing said housing into an upper chamber and a lower chamber;

(d) a lower head attached to said housing to define a lower chamber below said piston means wherein said lower chamber is adapted to receive and store a sample of interest, and further wherein said upper chamber receives a back pressure charge acting on said piston means to maintain a specified pressure on said piston means;

(e) sight glass means connected with said lower head and having a chamber communicating with said lower chamber for receiving B S & W into said sight glass means, said sight glass means further including a specified volume for receiving B S & W; and

(f) sight glass piston means movable in said sight glass means to selectively enable filling of said sight glass means.

4,463,600

AUTOMATIC MEASUREMENT OF AREAS

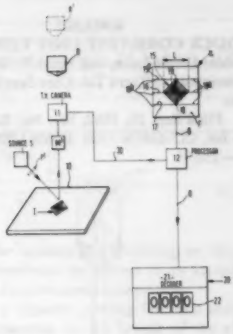
Donald A. Hobbs, Solihull, and Geoffrey W. Rowe, Birmingham, both of England, assignors to University of Birmingham, Birmingham, England

Filed Aug. 24, 1981, Ser. No. 295,790

Claims priority, application United Kingdom, Sep. 23, 1980, 8030640

Int. Cl.³ G01N *3/48, 3/42*

U.S. Cl. 73—81 **9 Claims**



1. A hardness testing apparatus for determining the hardness of a test piece comprising:

means for supporting the test piece in a predetermined position;

indenter means for making an indentation in the test piece;

means for directing an electromagnetic medium onto the test piece;

television camera means responsive to said medium for providing a signal which varies in accordance with variations in intensity of said medium reflected from said test piece;

electrical processing means for processing the signal to provide an output dependent upon the area of the indentation in the test piece; and

means for interpreting said output to determine the hardness of the test piece in which the indentation is made.

4,463,601

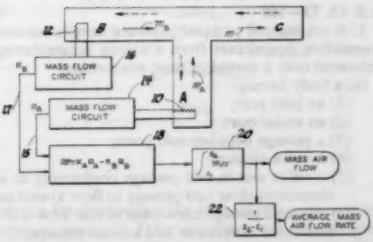
METHOD AND APPARATUS FOR MEASURING MASS AIRFLOW

Rodney B. Rask, Grosse Pointe Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 23, 1983, Ser. No. 496,953

Int. Cl.³ G01F *1/76, 7/00*

U.S. Cl. 73—118 **6 Claims**



1. In an airflow system subject to forward and reverse flow and having two flow branches A and B meeting at a junction to supply air to a passage C wherein the branches carry differ-

ent proportions of airflow in the forward and reverse directions and the reverse flow proportion in branch B is greater than the forward flow proportion, the method of measuring mass airflow rate m through the passage comprising the steps of measuring mass airflow rate in each branch irrespective of flow direction to obtain instantaneous mass flow rate signals R_A and R_B for branches A and B, respectively, and combining the rate signals according to the relationship $m=K_A R_A - K_B R_B$ where K_A and K_B are constants determined by sensor characteristics and junction flow characteristics.

4,463,602

ROCK CORE TEST UNIT VIBRATOR

Nyle S. Stoddard, Salt Lake, and Scott W. Butters, Davis, both of Utah, assignors to Terra Tek Core Services, Inc., Salt Lake City, Utah

Filed Sep. 28, 1982, Ser. No. 426,121
Int. Cl.³ G01N *1/08*; B06B *1/04, 1/12*
U.S. Cl. 73—153 **13 Claims**

1. A rock core test unit vibrator consisting of, a housing arranged for releasable coupling to a barrel of a rock core test unit wherein a rock core is deposited, the housing providing a mount whereto a vibrator means is secured such that an output therefrom is directed into said barrel; means for supporting said barrel above the horizontal such that gravity will act on said rock core deposited therein to draw said rock core therefrom; and vibrator means secured to said housing arranged to generate an output vibration for transmission into said barrel that is of sufficient intensity and is at a frequency to produce a vibration in said barrel that is at the barrel resonance frequency to vibrate that barrel so as to dislodge said rock core deposited therein.

4,463,603

VOLUME ANALYZER FOR CRUDE OIL SAMPLING SYSTEM INCLUDING BITE CHECKING APPARATUS

Robert H. Welker, Sugar Land, Tex., assignor to Welker Engineering Company, Sugar Land, Tex.

Filed Jan. 24, 1983, Ser. No. 460,480
Int. Cl.³ G01M *19/00*
U.S. Cl. 73—168 **11 Claims**

1. A pressurized pumped pulsating sample accumulator for connection downsteam from a source accumulating samples delivered over a period of time, comprising:

(a) a body having:
(1) an inlet port;
(2) an outlet port;
(3) a passage between said ports;
(4) a valve element;
(5) a valve seat in said passage conforming to said valve element to close said passage to flow to said outlet port;
(6) a second passage connected so that flow is diverted by said valve element to said second passage;

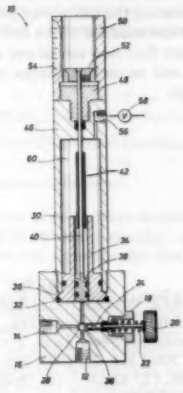
(b) a hollow closed sleeve supported by said body;

(c) a reducer sleeve located in said hollow sleeve and having a volumetric capacity of specified size;

(d) a piston in said reducer sleeve, said piston closing said reducer sleeve and defining in said reducer sleeve a sample storage chamber;

(e) said reducer sleeve being located to introduce sample through said second passage into said sample storage chamber;

(f) an elongate rod connected to said piston and movable thereby;



(g) calibrated indicator means supported by said closed sleeve and externally located to be viewed by a user to indicate volume within said reducer sleeve in said sample storage chamber; and

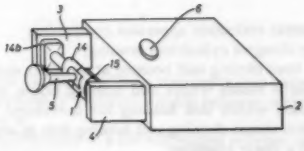
(h) said sample storage chamber accumulating sample to move said piston and thereby move said rod, said rod operatively cooperative with said indicator means to form an indication of sample volume with said indicator means.

4,463,604

LIQUID QUANTITY DETECTING APPARATUS

Junji Kitagawa; Shigeyuki Akita, both of Okazaki, and Sotoo Kitamura, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 2, 1982, Ser. No. 384,387
Claims priority, application Japan, Jun. 9, 1981, 56-89342
Int. Cl.³ G01F *23/20*
U.S. Cl. 73—296 **5 Claims**



1. An apparatus for detecting a quantity of liquid stored within a container, comprising:

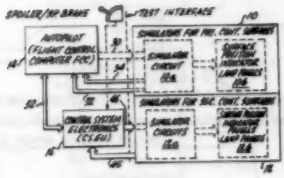
a torsion bar mounted on a stationary structure for supporting said container thereon in such a manner that said torsion bar is twisted at a torsional angle in dependence upon the weight of the stored liquid within said container; and

an electric detector for electrically detecting the torsional angle of said torsion bar to generate an output signal indicative of the quantity of the stored liquid based on the detected torsional angle.

4,463,605
SIMULATOR CIRCUIT FOR ELECTROHYDRAULICALLY CONTROLLED AIRCRAFT SURFACES

Leon H. McDowell, Lynnwood; Roger E. Weber, Auburn, and Daniel J. Schmieder, Renton, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 18, 1982, Ser. No. 379,468
Int. Cl.³ G01N 33/00
U.S. Cl. 73—432 SD 17 Claims



1. A simulator apparatus for simulating an electrohydraulic actuator and actuator/surface position sensing transducer for an actuator-controlled aircraft surface, wherein the position sensing transducer is of the linear variable differential transformer type, for closed-loop testing of aircraft controls of the type that generate actuator/surface positioning electrical command signals and receive as feedback, actuator/surface position feedback signals from said position-sensing transducer, comprising:

input amplifier means for receiving an electrical surface-positioning command signal;

signal integrator means connected to said input amplifier means for integrating the command signal at a predetermined rate, said rate being selected to produce an integrated command signal that simulates a response of an electrohydraulic actuator;

modulating circuit means having first and second input means and a differential output means;

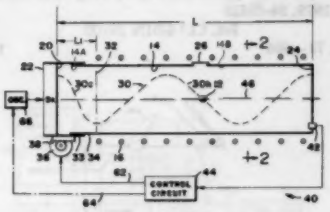
reference signal source means for producing an alternating current reference signal having predetermined frequency, phase and amplitude, said first input means of said modulation circuit means being connected to said integrator means to receive said integrated command signal and said second input means of said modulation circuit means being connected to receive said alternating current reference signal so as to produce at said differential output means, differential alternating current signals that vary differentially in amplitude as a function of said integrated command signal; and

a pair of output transformers each having a primary winding and a secondary winding, said primary windings of said pair of output transformers connected to said differential output means of said modulation circuit means for receiving said differential alternating current signals, and said secondary windings connected in series-opposing relation for simulating an output of an actuator/surface position transducer of the linear variable differential transformer type, whereby an alternating current signal is produced across the series-opposing secondary windings that varies in amplitude and phase in response to said surface-positioning command signal received at said input amplifier means.

4,463,606
HIGH TEMPERATURE ACOUSTIC LEVITATOR

Martin B. Barmatz, Glendale, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 26, 1983, Ser. No. 526,750
Int. Cl.³ F16C 32/00
U.S. Cl. 73—505 9 Claims



1. Apparatus for acoustically levitating an object in a high temperature environment by the use of an acoustic generator lying in a colder environment, comprising:

walls forming a chamber having first and second opposite end walls separated by the length of the chamber, said chamber having a first end portion adjacent to said first end wall and having levitation portion spaced from said first end wall;

means operable to adjust the length of said chamber;

means for applying heat to said levitation portion to raise its temperature above that of said first end portion;

an acoustic generator coupled to said chamber substantially at said first end wall to apply sound waves thereat to pass along the length of the chamber;

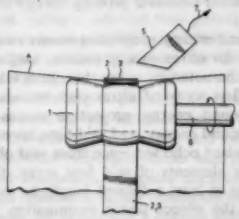
an acoustic pressure sensor coupled to the chamber; and

a feedback loop controller means responsive to said pressure sensor, for operating said length adjusting means to obtain a maximum acoustic pressure at said sensor.

4,463,607
APPARATUS FOR DETECTING THE CONDITION OF A SHEET

Graham H. Hilton, Lovedean, England, assignor to De La Rue Systems Limited, Portsmouth, England

Filed Aug. 18, 1982, Ser. No. 409,213
Claims priority, application United Kingdom, Aug. 20, 1981, 8125455
Int. Cl.³ G01N 33/34
U.S. Cl. 73—587 8 Claims



1. Apparatus for determining the stiffness of a note or document comprising means (1, 2) for conveying the note (4) along a flow path, bending means (3) at a given location in the flow path for continuously bending the note (4) during its movement past that location, a microphone (5) arranged to respond to noise produced by the note while it is being bent, and means

(20–25) responsive to a noise signal from the microphone to indicate the degree of stiffness of the note.

4,463,608

ULTRASOUND IMAGING SYSTEM

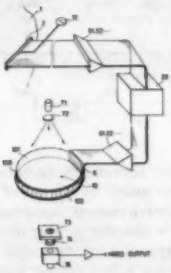
Yasuhito Takeuchi, and Keiki Yamaguchi, both of Musashino, Japan, assignors to Yokogawa Hokushin Electric Corp., Tokyo, Japan

Filed May 1, 1980, Ser. No. 145,852

Claims priority, application Japan, May 7, 1979, 54-55524; May 7, 1979, 54-55525

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—606 **19 Claims**



1. An ultrasound imaging system comprising:

a first array of ultrasound transducers coupled to an object space which accepts and transducers the ultrasound energy generated or scattered by an object body in said object space,

time inversion means coupled to said first array of ultrasound transducers for storing the signals from said first array and then providing inverse readouts of the same,

a second array of ultrasound transducers driven by the inversely readout signals from said time inversion means,

image reconstitution space filled by optically and acoustically transparent, isotropic material coupled to said second array of ultrasound transducers for providing a replication of the ultrasound image of said object body with ultrasound energy supplied by said second array of ultrasound transducers to said image reconstitution space,

visualization means coupled to said image reconstitution space to display the ultrasound energy distribution in said image reconstitution space, said visualization means having at least a probing energy source for projecting said probing energy in the reconstitution space in a predetermined manner, and image sensor means responsive to interaction energy in said reconstitution space which has interacted with said probing energy in said reconstitution space,

ultrasound energy projection means coupled to said object space for ultrasonically exciting said object body to provide characteristic echos therefrom which are detected by said first array of ultrasound transducers, wherein said ultrasound energy projection means transmits impulse ultrasound energy, and said time inversion means accepts the pulsed echo sequence from said object body via each of the elements of said first array, the echo sequences having at least sufficient length to include all the echos from the object under examination responsive to said pulsed ultrasound energy, and each of said echo sequences are subsequently readout inversely in their time axis from said time inversion means providing a simultaneous and parallel data string at a predetermined readout rate, said second array being driven by said data string to reproject an inversely travelling set of said echo sequences, and

having waveform memory means in said time inversion means in which multiple echo data sets over a multiple number of said pulsed soundings of said object body are effectively averaged to obtain an averaged echo data set with reduced noise and/or ambiguity in said replicated image.

4,463,609

METHOD AND APPARATUS FOR TESTING THE SOUNDNESS OF THE WELDS OF OFF-SHORE STRUCTURES DURING SERVICE

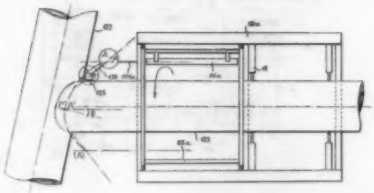
Paul Thomé, and Gopal Thomé, both of 8 rue Coutureau, Saint Cloud, France (92210)

Filed Dec. 28, 1981, Ser. No. 335,321

Claims priority, application France, Dec. 29, 1980, 80 27714

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—637 **5 Claims**



1. A scanner device for testing at a distance the presence of cracks in a assembly of welded tubular members, such as member nodes or tappings, said device having examining probes adapted to carry out an orbital movement over the outer surface of the members and to move close to the welds and be oriented relative to the latter, and further comprising:

a fixed open U-shaped squirrel-cage structure, fixed jacks adapted to position said fixed squirrel-cage structure transversely astride one of said members and to fix said squirrel-cage structure to said member, said squirrel-cage structure being adapted to be coaxially aligned with the theoretical axis of said member, and guide roller tracks open as a U, included in said fixed structure;

a movable structure also in open U-shaped squirrel-cage form, guided by said roller tracks and adapted to rotate inside the fixed structure,

a radially adjustable retractable sleeve, borne by said movable structure parallel to its axis;

an arm sliding inside said sleeve; and

one or more orientable measuring heads, borne at the end of said arm by a wrist endowed with several degrees of freedom for orienting said heads; wherein

the examining probes are fixed to said head and are adapted to be brought into contact with the members to be checked.

4,463,610

TUNED VIBRATION DETECTOR

Philip M. Anderson, III, Chatham, N.J.; Donald Raskin, New York, N.Y., and Ronald K. Reich, Phillipsburg, N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 18, 1982, Ser. No. 349,739

Int. Cl.³ G01L *23/22*; G01H *1/00*

U.S. Cl. 73—654 **19 Claims**

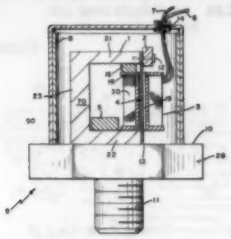
1. A vibration sensor to detect vibrations having a preselected frequency comprising:

a. tuning means mechanically resonant with a preselected vibrational frequency to be detected, said tuning means comprising a frame having at least one mechanical resonant frequency and having at least one cantilevered element extending therefrom;

b. a element of positive magnetostriction glassy metal, which is connected substantially perpendicular to said cantilevered element to undergo a varying tensile stress in re-

sponse to vibrational movements of said cantilevered element and which is connected to said cantilevered element with a tensile prestress applied thereto;

c. magnetic biasing means for imparting a magnetization to said magnetostrictive element; and



d. means associated with said magnetostrictive element for detecting changes in the magnetization thereof due to the varying stress applied thereto.

4,463,611

EXTENSOMETER

Rainer Glötzl, Ettlingen, and Franz Glötzl, Rheinstetten, both of Fed. Rep. of Germany, assignors to Glötzl Gesellschaft für Baumesstechnik mbH, Rheinstetten, Fed. Rep. of Germany

Filed May 27, 1982, Ser. No. 382,579

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1982, 3211822

Int. Cl.³ G01B 7/16

U.S. Cl. 73—784 **6 Claims**

1. An extensometer for measuring movements in rock structures and in foundations, said extensometer comprising:

(a) an anchoring device adapted to be secured to said structure or foundation;

(b) a single continuous flexible measuring rod having one end adapted to be connected to said anchoring device and having a free end bearing, said measuring rod being sufficiently resilient such that it may be wound and then unwound to assume a substantially linear configuration;

(c) a pick-up element;

(d) an encasing tube adapted to encase the measuring rod and in which the measuring rod is freely movable; and

(e) an extensometer head adapted to be connected to the encasing tube so as to be adjacent the pick-up element, whereby, when assembled, the change in position of the pick-up element in relation to the extensometer head is measurable as an indication of said movements.

4,463,612

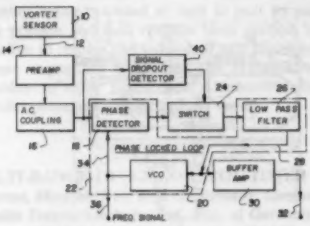
ELECTRONIC CIRCUIT USING DIGITAL TECHNIQUES FOR VORTEX SHEDDING FLOWMETER SIGNAL PROCESSING

William L. Thompson, Chardon, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 10, 1981, Ser. No. 329,500

Int. Cl.³ G01F 1/32

U.S. Cl. 73—861.22 **5 Claims**



2. A circuit for processing the vortex shedding frequency signal of a vortex shedding flowmeter comprising:

a phase detector for receiving the vortex shedding frequency signal and providing an output signal corresponding thereto;

a low pass filter for receiving the output of the phase detector and producing an analog voltage signal corresponding thereto;

a voltage controlled oscillator connected to an output of the low pass filter for generating a tracking frequency signal corresponding to the vortex shedding frequency signal;

means connected to an output of the voltage control oscillator and the low pass filter for providing a frequency signal and an analog signal;

accumulator means connected to said voltage controlled oscillator for receiving the tracking frequency signal;

timing means connected to said accumulator means for activating said accumulator to accumulate the tracking frequency signal during a selected time period with said accumulator means having digital output lines for generating a digital signal corresponding to the accumulated tracking frequency signal; and

said timing means including a plurality of resistors connected in series, each having series-connected electronic switch, means for selectively opening said switches for establishing a selected resistance across said plurality of series-connected resistances, a resistor connected to said series-connected resistance, means connected to said connected resistances for producing a current which is proportional to an equivalent resistance formed by said connected resistances, a capacitor connected to said current producing means for charging to a selected level voltage at a time which depends on the current supplied by said current producing means and comparator means connected between said capacitor and said accumulator means for activating said accumulator means during the time that said capacitor charges to said selected voltage.

4,463,613

CALIBRATABLE TURBINE WHEEL GAS METER WITH EXCHANGEABLE MEASURING INSERT

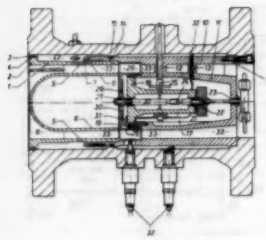
Dieter Schmittner, Hofheim, and Manfred Schwarz, Taunusstein, both of Fed. Rep. of Germany, assignors to Elster AG Mess- und Regeltechnik, Mainz-Kastel, Fed. Rep. of Germany

Filed Aug. 6, 1982, Ser. No. 406,093

Claims priority, application European Pat. Off., Oct. 30, 1981, 81109360.8

Int. Cl.³ G01F 1/11, 1/115, 1/12

U.S. Cl. 73—861.83 12 Claims



1. In a turbine wheel gas meter for measuring the flow therethrough of a gaseous medium of the type having, a tube member having a lateral stud and provided with means for connecting said tube member to a gas conduit, a tubular measuring insert adapted to be inserted coaxially and exchangeably into said tube member, said insert comprising a cylindrical housing member, a lateral passage for registration with said lateral stud when said insert is so inserted, an inlet body disposed coaxially within said housing member, an outlet body disposed coaxially within said housing member downstream from said inlet body, said outlet body defining an annular flow passage together with said inlet body and with the interior wall of said housing member and being connected rigidly to said housing member by means of connecting webs, including a bearing housing disposed coaxially within said outlet body and having end faces in which a shaft is journalled rotatably, and including a turbine wheel fixed to one end of said shaft projecting from the end face of said bearing housing which faces said inlet body, the blades of said turbine wheel being disposed in a portion of said flow passage formed intermediate said inlet body and said outlet body; and counting means mounted on said lateral stud for indicating the volume of gas which has passed through said flow passage, said counting means being coupled by a clutch to a transmission shaft which extends through a bore in said lateral stud and through said lateral passage of said measuring insert and which is drivingly connected to said shaft of said turbine wheel;

a pressure space in communication with said flow passage when said insert is so inserted;

means for measuring the pressure in said space;

a pulse generator included in said measuring insert and cooperating with said turbine wheel for generating a defined number of pulses corresponding to a repdetermined number of turbine wheel revolutions; and

an exchangeable transmission gear in said counting means for relating such an indicated volume of such generated pulses.

4,463,614

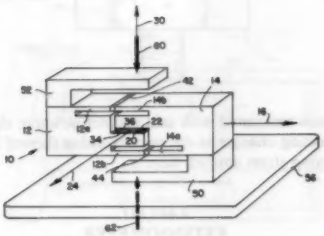
FORCE TRANSDUCER

Shih-Ying Lee, Lincoln, Mass., assignor to Setra Systems, Inc., Acton, Mass.

Continuation-in-part of Ser. No. 265,087, May 19, 1981. This application Mar. 18, 1982, Ser. No. 359,619

Int. Cl.³ G01L 1/14

U.S. Cl. 73—862.64 11 Claims



1. A force transducer comprising:

A. a pair of elongated members, each of said members extending along a common central axis and having at least in part complementary faces at their adjacent ends, each complementary face having at least one sensing portion angularly offset from said central axis by less than ninety degrees,

wherein each elongated member includes a pair of planar slots extending from its complementary face to define upper and lower beam portions, the first slot having depth A and the second slot having depth B, said second slot being spaced apart in the direction of a first reference axis from said first slot, said first reference axis being perpendicular to said central axis, wherein said upper and lower beam portions are tapered in the direction of said central axis and extending toward said complementary face,

whereby said upper and lower beam portions of each elongated member are relatively flexible about axes parallel to a second reference axis, said second reference axis being perpendicular to said central axis and said first reference axis, said upper beam portion being bounded on one side by said first slot and on the other side by a surface portion of the corresponding elongated member, and said lower beam portion being bounded on one side by said second slot and on the other side by a surface portion of the corresponding elongated member,

B. means for joining the upper beam portions of said pair of elongated members and the lower beam portions of said pair of elongated members to form a monolithic structure, wherein said sensing portions of said complementary faces are mutually offset in the direction of said first reference axis, and are movable in the direction parallel to said first reference axis and relatively immovable otherwise,

C. planar electrically conductive members on said sensing portions of said complementary faces,

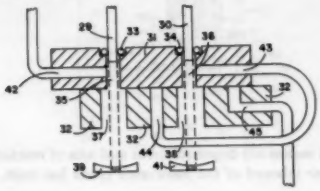
whereby the capacitance associated with said conductive members is related to the forces applied to said pair of elongated members.

4,463,615

LIQUID TRANSFER VALVE

Edmund E. Buzza, Fullerton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 143,238, Apr. 24, 1980, Pat. No. 4,297,903. This application Jul. 6, 1981, Ser. No. 280,437
The portion of the term of this patent subsequent to Nov. 3, 1998, has been disclaimed.
Int. Cl.³ G01N 35/08
U.S. Cl. 73—863.32 10 Claims



1. A liquid transfer valve for use with a plurality of probes, said probes being movable relative to said valve in a plane of travel toward and away from said valve, said valve comprising:

a first valve portion including a plurality of access ports extending through said first valve portion approximately parallel to said plane of travel to allow probe movement therethrough, said first valve portion also including at least one conduit communicating with each said access port; and

at least one movable valve portion mounted on said first valve portion for relative movement to a pickup position and a delivery position;

said movable valve portion including a plurality of clearance holes extending through said movable valve portion approximately parallel to said plane of travel, each said clearance hole aligned with a corresponding access port in said pickup position to allow probe movement therethrough; and

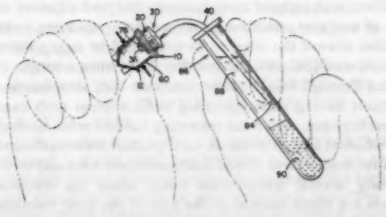
said movable valve portion further including at least one passageway communicating with each said access port in said delivery position.

4,463,616

SAMPLE HANDLING APPARATUS

Jacob B. Blecher, Lexington, Mass., assignor to Instrumentation Laboratory Inc., Lexington, Mass.

Continuation-in-part of Ser. No. 361,448, Mar. 24, 1982, abandoned. This application Sep. 2, 1983, Ser. No. 529,083
Int. Cl.³ B01L 3/02
U.S. Cl. 73—864.11 18 Claims



1. Sample handling apparatus comprising a disposable, single use sample vessel and sample transfer structure for detachable connection to said sample vessel,

said sample vessel having reclosable port structure and coupling structure adjacent said port structure;

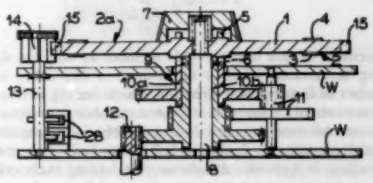
said sample transfer structure having a transfer passage with an opening at one end for insertion into a reservoir of liquid, a port opening probe portion at the end of said transfer passage opposite said one end, and coupling structure cooperating with the coupling structure of the sample vessel, one of said sample vessel and said sample transfer structure having a flexible, resilient wall portion, said sample vessel and said sample transfer structure being movable relative to one another to a position in which said coupling structures are in sealing engagement to provide a sealed chamber between said transfer structure and said sample vessel in which position said probe portion opens said reclosable port structure to provide a flow path between transfer passage and said sample vessel, said sealed chamber being bounded at least in part by said resilient wall portion and said resilient wall portion being compressible to reduce the volume of said chamber and upon release expanding to reduce the pressure within said chamber to draw liquid from a reservoir through said transfer passage into said sample vessel.

4,463,617

MILTI-RANGE CYCLE CONTROL TIMER UNIT

Fritz Thoma, Haslach, Fed. Rep. of Germany, assignor to Dieter Graesslin Feinwerktechnik, Fed. Rep. of Germany

Filed Nov. 5, 1981, Ser. No. 318,447
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1980, 3041687
Int. Cl.³ H01H 7/08, 43/10
U.S. Cl. 74—3.5 19 Claims



1. A control timer unit for use with multiple range cycles comprising a gear means driven by a motor and having at least one rotary output means facing in one direction and a rotatable continuous program carrier releasably mounted in said unit for cylically triggering signal switch means, said program carrier being formed with at least two opposed sides, each having a respective, different program range scale and a respective different clutch portion for selectively engaging with said at least one rotary output means for driving said carrier at different rotational speeds each associated for use with one particular program range scale depending on which side is facing said rotary output means.

4,463,618

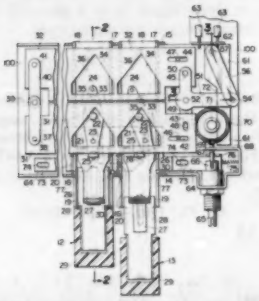
PUSHBUTTON TUNER

Tamaki Ohashi, Tokyo, Japan, assignor to Nihon Technical Kabushiki Kaisha, Japan

Filed Jun. 2, 1980, Ser. No. 155,167
Claims priority, application Japan, Jun. 4, 1979, 54-68838; Aug. 22, 1979, 54-106032
Int. Cl.³ H03J 5/12
U.S. Cl. 74—10.33 10 Claims

1. A pushbutton tuner including a support, tuning means mounted on the support so as to be movable to positions corresponding to preset tuning frequencies, and a plurality of pushbutton actuators which may be selectively preset to bring the tuning means to positions corresponding to the respective

tuning frequencies, each pushbutton actuator including a slide member having its opposite ends carried by the support so as to be movable between its inoperative and its operative positions relative to the support in a direction perpendicular to the direction of movement of the tuning means, a movable control member mounted on the slide member for controlling the movement of the tuning means, the tuning means including a pair of movable members, a variable tuning element which is adjusted in accordance with a stroke through which the pair of movable members move, a link assembly connecting the pair of movable members with the variable tuning element, the link assembly being constructed such that whenever one of the movable members moves in one direction, the other movable member is caused to move in the opposite direction, and transmitting means responsive to a movement of the slide member to its operative position for transmitting the movement of the control member to at least one of the movable members so as to cause the movable member to move in one direction, the



movement of said one movable member in said one direction being terminated when a movement of the other movable member in the opposite direction which occurs in response to the movement of said one movable member is constrained by the control member, the link assembly including first and second substantially L-shaped link levers having their one end extending in opposite directions and having their other end disposed in overlapping relationship, and first and second link bars having their one end connected to the other ends of the first and the second link levers, respectively, said one end of the first link lever being pivotally connected with one end of said one movable member, said one end of the second link lever being pivotally connected with one end of said other movable member, the bend of the first and the second link levers being pivotally mounted on the support in common, and the other ends of the first and the second link bars being pivotally mounted on the movable member of the variable tuning element.

4,463,619

CRANK MECHANSIM IN A PUSHBUTTON TUNER

Takao Chaki, Tokyo, Japan, assignor to Clarion Co., Ltd., Japan

Filed Dec. 9, 1981, Ser. No. 328,937

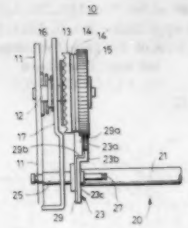
Claims priority, application Japan, Dec. 12, 1980, 55-177587

Int. Cl.³ H03J *5/12;* **G05G** *1/02*

U.S. Cl. 74—10.33 **2 Claims**

1. In a pushbutton tuner having parallel crank bars joiningly attached together at the ends thereof in a spaced-apart relationship by a pair of side plates, said side plates having associated therewith pivotal mounting means for allowing rotation of said bars about an axis generally parallel thereto, crank gear means fixedly attached to one of said side plates, and a manual tuning mechanism having a drive gear, said drive gear being disposed in meshing engagement with said crank gear so that rotation of said drive gear rotates said crank bars about said axis, the improvement wherein:

said crank means comprises an integral extension of one of said side plates having an outer arcuate tooth-bearing portion thereof inwardly offset so that the teeth of said



crank means are disposed about said axis of rotation and in a plane inboard of the associated crank bar ends.

4,463,620

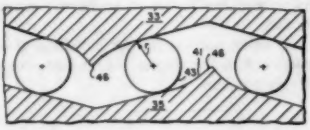
INFINITELY VARIABLE TRACTION ROLLER TRANSMISSION

Paul L. Horton, Austin, Tex., assignor to Excelermatic Inc., Austin, Tex.

Filed Sep. 7, 1982, Ser. No. 415,319

Int. Cl.³ F16H *15/08, 53/00, 15/00*

U.S. Cl. 74—200 **4 Claims**

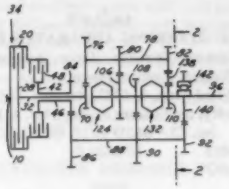


1. An infinitely variable traction roller transmission comprising: coaxial input and output shafts; oppositely disposed toric traction discs, one being supported by each of said shafts, for rotation therewith; at least two motion transmitting traction rollers arranged in radial symmetry with respect to the axis of the input and output shafts and in engagement with said toric discs for the transmission of motion therebetween; a pivotal support structure for each of said traction rollers permitting a change of the ratio of motion transmission between the toric traction discs; and an axial cam structure disposed adjacent at least one of said toric traction discs for forcing said one toric traction disc toward the other so as to cause firm engagement of the traction rollers with the traction discs when a torque is transmitted through said transmission, said cam structure including cams having main operating surface areas with cam crests therebetween, said main operating surface areas having a lead so selected as to provide an axial contact force sufficient to cause firm engagement of said traction rollers with said toric discs during normal transmission ratios when the traction rollers axes are about normal to the axis of the toric traction discs and having areas with increased slopes adjacent the crests so as to provide for increased leads in the areas adjacent the crests thereby to reduce the axial contact force in high transmission ratio pivot positions of traction rollers.

4,463,621
MULTIPLE COUNTERSHAFT AUTOMATIC TRANSMISSION

Alan R. Fisher, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1981, Ser. No. 333,847
Int. Cl.³ F16H 3/08; F16D 47/04, 21/02
U.S. Cl. 74—330 3 Claims



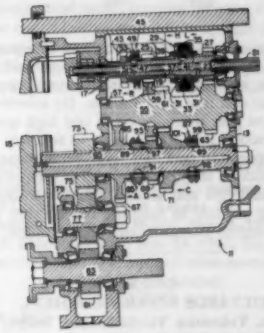
1. A multiple speed ratio transmission comprising:
first and second input shafts driven from the crankshaft of an engine the first input shaft having a gear fixed thereto;
first clutch means for selectively producing a driving connection between the engine crankshaft and the first input shaft;
second clutch means for selectively producing a driving connection between the engine crankshaft and the second input shaft;
a first countershaft driven by the gear of the first input shaft upon engagement of the first clutch means, having pinions fixed thereto that form a portion of the second forward speed ratio and reverse drive torque paths;
a second countershaft driven by the second input shaft upon engagement of the second clutch means, having pinions fixed thereto that form a portion of the first and third forward speed ratios;
an output shaft having gears carried thereon that form another portion of the second and third forward speed ratio and reverse drive torque paths, said forward speed ratio gears being in continuous engagement with the pinions on the crankshafts that form a portion of the second and third forward speed ratio torque paths;
a first forward speed ratio gear carried by the output shaft and driveably connected thereto by an overrunning clutch whereby a one-way driving connection is made therebetween, the first speed ratio gear being in continous engagement with the first speed ratio pinion;
synchronizer clutch means carried by the output shaft for selectively driveably connecting to the output shaft the gear that is fixed to the first input shaft, and the second and third forward speed ratio gears and reverse drive gear that are carried on the output shaft; and
a reverse drive idler continously engaged with the reverse gear and reverse pinion.

4,463,622
TRANSMISSION AND REVERSE GEAR SYNCHRONIZING THEREFOR

Thomas W. Freiburger, Davenport, Iowa, assignor to Deere & Company, Moline, Ill.

Continuation-in-part of Ser. No. 111,315, Jan. 11, 1980, abandoned. This application Feb. 18, 1982, Ser. No. 349,935
Int. Cl.³ F16H 5/06, 57/10, 3/08
U.S. Cl. 74—337.5 3 Claims

1. In combination with a transmission particularly suited for off-road vehicles, said transmission including an input shaft rotatably mounted in said transmission carrying a high and low gear rotatably mounted on said input shaft, high/low synchronizing clutch means for selectively providing synchronized communication between said input shaft and said high gear or said low gear, a reverse gear rotatably mounted on said input shaft, and non-synchronized clutch means for providing driving communication between said input shaft and said reverse gear, an output shaft rotatably mounted in said transmission carrying a fixed gear, a gear shaft rotatably mounted in said transmission carrying a plurality of gears and clutch means for selectively providing driving communication between one of said gears and said gear shaft, and a fixed gear in constant mesh with said fixed gear on said output shaft, a first countershaft rotatably mounted in said transmission having a plurality of fixed gears in constant mesh with a corresponding one of said plurality of gears mounted to said gear shaft, and at least one of said gears on said first countershaft in constant mesh with said high gear on said input shaft and at least one of said gears in constant mesh with said low gear on said input shaft, a second countershaft rotatably mounted in said transmission having a first gear fixably mounted thereon in constant mesh with said reverse gear on said input shaft and a second gear in constant mesh with one of said gears on said first countershaft, first shifting collar means for causing said high/low synchronized clutch means to selectively cause said high gear or said low



gear to drivingly communicate with said input shaft, second shifting collar means for causing said reverse clutch to selectively cause said reverse gear to drivingly communicate with said input shaft, first means for selectively causing said clutch means associated with said gear shaft to drivingly engage one of said gears mounted to said gear shaft; wherein the improvement comprises: cam means for communicating with said first shift collar means and said second shift collar means such that movement of said cam means determines the resulting clutch action as predicted by said first and second shift collars, said cam means to dictate a clutching action when said transmission is to be shifted from neutral to reverse such that said high/low range synchronized clutch means is momentarily engaged just prior to engagement of said reverse clutch, said cam means being independently operable with respect to first means such that reverse gear communication is obtainable in combination with any one of said gear in communication with said gear shaft.

4,463,623
TRACTOR TRANSMISSION STRUCTURE

Junji Miyata, Kyoto, and Yasuhisa Matsushita, Sakai, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

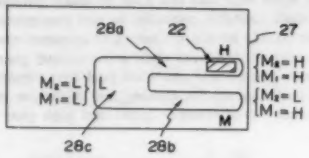
Filed Oct. 29, 1981, Ser. No. 316,486
Claims priority, application Japan, May 20, 1981, 56-73475[U]
Int. Cl.³ B60K 20/02; F16H 3/02
U.S. Cl. 74—473 R 5 Claims

5. A tractor transmission structure comprising:
first and second gear transmissions operatively connected in series, said first and second gear transmissions respectively including first and second speed change operator means for changing the associated gear transmission between high and low speed positions;
means defining a U-shaped guide opening to establish a

U-shaped shift pattern, said guide opening being defined by first and second leg openings respectively establishing first and third shift positions, said first and second leg openings being separated from one another by a base opening which establishes a second shift position;

a manually operable speed change shift lever mounted in said U-shaped guide opening so as to be shiftable between said first, second and third shift positions established by said U-shaped guide opening; and

linkage means operatively interconnecting said shift lever with said first and second speed change operator means,



said linkage means for (a) selectively changing each said first and second gear transmissions to said low speed position in response to said shift lever being manually shifted into said first shift position, (b) selectively changing said first gear transmission to said high speed position and said second gear transmission to said low speed position in response to said shift lever being manually shifted into said second shift position, and (c) selectively changing each said first and second gear transmissions to said high speed position in response to said shift lever being manually shifted into said third shift position.

4,463,624

TILTABLE STEERING WHEEL

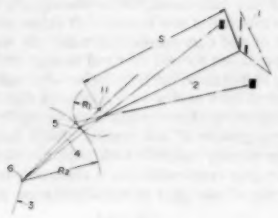
Junichi Shibata, Yokosuka; Yuichi Sanada, Tokyo, and Shigeo Shingyooji, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 23, 1980, Ser. No. 199,884

Claims priority, application Japan, Oct. 26, 1979, 54-137743

Int. Cl.³ B62D *1/18*

U.S. Cl. 74—493 **6 Claims**



1. A tiltable steering device for a vehicle having a vehicle body, comprising:

a steering wheel;

a steering shaft having its upper end fixed to the steering wheel;

a steering column for rotatably supporting the steering shaft;

a connecting shaft having its upper end connected through a universal joint to the lower end of the steering shaft;

means for tiltably supporting the steering column in such a way that the steering shaft can be tilted from a standard position upwardly or downwardly within a predetermined range around a rotation axis, the standard position being at the center between the upper and lower limits of steering wheel adjustment;

the improvement including:

the rotation axis of the steering shaft being positioned above and apart from the universal joint and intersecting, at a point, the straight line formed by the intersection of a first plane and a second plane when the steering shaft is held in said standard position, the first plane being vertical and including the axis of the steering shaft, the second plane being at a right angle to the first plane and including the axis of the connecting shaft.

4,463,625

TELESCOPIC STEERING APPARATUS FOR VEHICLES

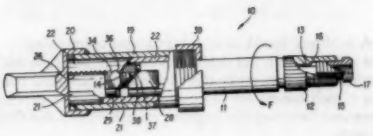
Masumi Nishikawa, Toyoake, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 4, 1982, Ser. No. 354,771

Claims priority, application Japan, Mar. 4, 1981, 56-30564[U]

Int. Cl.³ B62D *1/18*; G05G *5/24*

U.S. Cl. 74—493 **6 Claims**



1. A telescopic steering apparatus for vehicles, comprising:

a main shaft having a tapered end portion and a projecting portion on an outer periphery thereof;

a locking rod inserted through said main shaft;

a locking member movable substantially axially according to the rotation of said locking rod relative to said main shaft and provided with a tapered end portion engageable with said tapered end portion of said main shaft and a projecting portion on the outer periphery thereof, said projecting portion having a toothed face;

a holder member provided with a toothed portion engageable with said toothed face of said locking member;

an outer shaft integrally receiving said holder member therein; and

an operating lever for releasing the engagement of said tapered portions of said main shaft and said locking member, and the engagement of said toothed face of said locking member and said toothed portion of said holder.

4,463,626

TILTABLE STEERING APPARATUS FOR VEHICLES

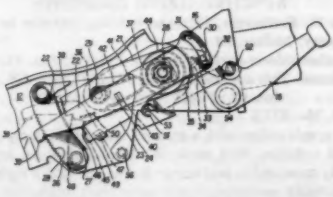
Kenichi Kazaoka, Nagoya; Teiji Okuyama, Toyota, and Masumi Nishikawa, Toyoake, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 16, 1982, Ser. No. 358,586

Claims priority, application Japan, Mar. 20, 1981, 56-40690

Int. Cl.³ B62D *1/18*

U.S. Cl. 74—493 **5 Claims**



1. A tiltable steering apparatus for vehicles for tiltably regulating a steering wheel by engagement of a pawl member and a latch member according to operation of an operating lever, comprising:

a memory engaged with said latch member and releasable from said latch member upon engagement of said latch member with said pawl member and engageable with said latch member upon disengagement of said latch member from said pawl member according to rotation of said operating lever;

a regulating means engageable with said pawl member upon release of said pawl member from said latch member and disengageable from said pawl member at an engagement position of said memory means with said latch member so as to engage said pawl member with said latch member at said engagement position; and

means for acting on said memory means for releasing said pawl member from said latch member and for moving said memory means with respect to said pawl member.

4,463,627

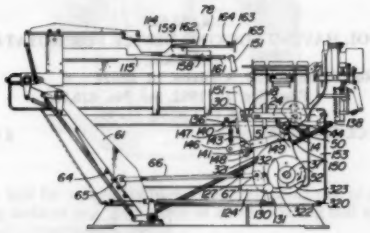
PISTON AND CYLINDER ASSEMBLY FOR BLOCKADE ARM

C. Kenneth Zelle, 7245 Leonard St., Philadelphia, Pa. 19115

Filed Feb. 3, 1981, Ser. No. 231,068

Int. Cl.³ F16H *53/06*

U.S. Cl. 74—569 **14 Claims**



1. Apparatus for regulating the motion of a reciprocable pivotable blockade linkage comprising a blockade arm and an arm provided with a cam follower, the arms being mounted on a common shaft wherein the cam follower rides on a rotary cam, comprising:

(a) fluid operated means pivotably coupled to the blockade arm for continuously resisting pivotable movement of the blockade arm from a retracted position to an advance position and for continuously assisting movement of the blockade arm from the advanced position back to the retracted position;

(b) means for regulating the flow of fluid to and from said fluid operated means to cause said fluid operated means to decreasingly resist the movement of said blockade arm from said retracted to said advanced position and to increasingly assist the movement of said blockade arm from said advanced position back to said retracted position; and

(c) said means for regulating the flow of fluid to and from said fluid to operated means being presettable to cause said fluid means to balance said blockade arm in said retracted position whereby the cam follower remains on the cam in reduced frictional engagement with the cam.

4,463,628

TRANSMISSION CONTROL INTERFACE MECHANISM

Brian A. Ahlschwede, and Kevin D. McKee, both of Waterloo, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 1, 1982, Ser. No. 364,288

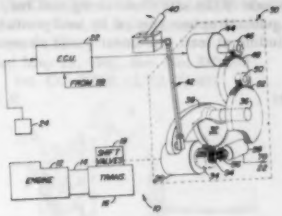
Int. Cl.³ B60K *41/08, 41/22;* F16D *43/22, 23/00*

U.S. Cl. 74—861 **11 Claims**

1. In a vehicle having a single manually movable gear shift lever and a hydraulically controlled transmission operated via a control valve assembly, a control interface mechanism comprising:

first mechanical means directly coupling the gear shift lever to the control valve assembly for actuating the control valve assembly to operate the transmission in response to movement of the gear shift lever;

motor means for moving in response to electrical control signals applied to an input thereof; and



second mechanical means coupled between the motor means and the control valve assembly to operate the transmission in response to movement of the motor means, the first and second mechanical means moving the gear shift lever in response to movement of the motor means.

4,463,629

ENERGY EFFICIENT DRIVE SYSTEM

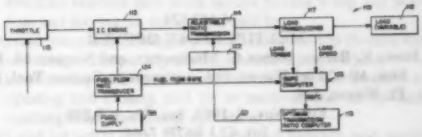
Sydney Himmelstein, Lake Bluff, Ill., assignor to S. Himmelstein and Company, Hoffman Estates, Ill.

Continuation of Ser. No. 91,337, Nov. 5, 1979, Pat. No. 4,381,684. This application Sep. 29, 1982, Ser. No. 428,417

The portion of the term of this patent subsequent to May 3, 2000, has been disclaimed.

Int. Cl.³ B60K *41/18*

U.S. Cl. 74—862 **5 Claims**



1. In a drive system having a drive responsive to actual variable load power to provide said load power with maximum input energy usage efficiency, the improvement comprising:

means for continuously sensing said actual load power and determining the necessary adjustment of said drive to cause the instantaneous brake specific energy consumption to be a minimum in providing said actual load power; and

means continuously adjusting said drive in accordance with the determined adjustment to obtain continuously minimum brake specific energy consumption operation of the drive for said actual load power.

4,463,630

CHAIN-SAW CHAIN SHARPENING DEVICE

John P. Turner, Houghton House, Ringmore, Kingsbridge, Devon, England

Filed Jan. 22, 1982, Ser. No. 341,648

Claims priority, application United Kingdom, Feb. 6, 1981, 8103784; Nov. 17, 1981, 8134543

Int. Cl.³ B23D *63/16*

U.S. Cl. 76—25 A **4 Claims**

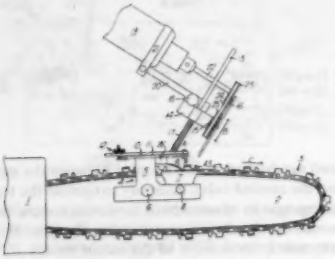
1. A chain-saw chain sharpening device which is releasably attachable to a portable chain saw to enable routing-type saw chain cutters to be sharpened in situ on the chain saw guide

bar, said device comprising a grinding wheel and a mounting arrangement including:

(a) a support structure releasably attachable to the chain-saw guide bar,

(b) a pivotable member mounted on said support structure for pivotal movement about an axis extending in the plane of the guide bar and perpendicular to the local direction of advance of the saw chain along said bar,

(c) a guide structure carried by said pivotable member and including at least one linear guide element which is con-



vergent with said axis in a direction towards the saw chain and makes an angle with a notional plane extending along and perpendicular to the said guide bar corresponding to the desired angle of undercut of the routing edge faces of said cutters,

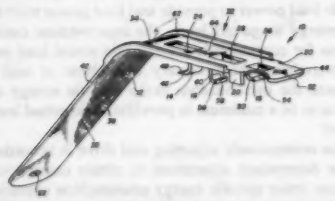
(d) a mounting block linearly displaceable along said at least one linear guide element and rotatably mounting the said grinding wheel such that the angle between the plane of the wheel and said notional plane corresponds to the said desired angle of undercut routing edge faces of said cutters.

4,463,631

MULTIPURPOSE OPENER

James E. Barnes; James G. Morkoetter, and Norman M. Robbins, all of Fort Wayne, Ind., assignors to Custom Tool, Inc., Ft. Wayne, Ind.

Filed Nov. 4, 1982, Ser. No. 439,070
Int. Cl.³ B67B 7/44
U.S. Cl. 81—3.1 R **5 Claims**



1. A multipurpose opener for cans having pull-off tabs or stay-on tabs on the shells thereof and bottles having caps, comprising:

a flat elongate body having upper and lower surfaces, opposite side edges, and opposing end portions,

one of said end portions having on its lower surface a first hook member extending downwardly therefrom, a remote end portion of said first hook member being substantially parallel to said one end portion and pointing in the general direction of the opposite end portion,

said remote end portion being adapted to be inserted through the ring member of a pull-off tab of a can and between the ring member and the can shell to thereby hook the ring member by said first hook member,

said one end portion having disposed between said first hook member and the distal end of said one end portion at least one projection extending downwardly from said lower surface, said projection being a predetermined distance from said first hook member and adapted to abut against the inner surface of the can shell when the ring member is hooked by said first hook member, whereby, upon lifting upwardly on said opposite end portion, said projection acts as a fulcrum during the removal of the pull-off tab by said first hook member, said opposite end portion being elongated and serving as a handle, a second hook member on said lower surface of said one end portion at a predetermined distance from the distal end of said one end portion and extending downwardly therefrom, a remote end portion of said second hook member being substantially parallel to said one end portion and pointing in the general direction of said distal end,

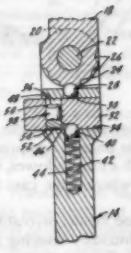
said second hook member remote end portion being adapted to engage the stay-on tab of a can and said distal end being adapted to abut against the top surface of the stay-on tab, whereby, upon lifting upwardly on said opposite end portion, said distal end acts as a fulcrum during the opening of the can by said second hook member.

4,463,632

TOOL HAVING LOCKING DEVICE FOR ROTATABLE HEAD

W. Rod Parke, R.F.D. 3, Dixon, Ill. 61021

Filed Sep. 29, 1982, Ser. No. 426,862
Int. Cl.³ B25B 13/00
U.S. Cl. 81—177.9 **6 Claims**



1. In a tool having a handle portion and a head portion, the head portion being rotatably attached to the handle portion such that the angular relationship between the longitudinal axes of the handle portion and the head portion may be altered to an angle other than 180°, and including means for temporarily holding the head portion at a particular angle with respect to the handle portion, the improvement comprising,

a. means for locking said temporary holding means to immobily clamp the head portion at a particular angle with respect to the handle portion, including a transverse bore in said handle portion proximate said head portion, and a lock bar slideably disposed within said bore, said lock bar being positionable in a first orientation to lock said temporary holding means and in a second orientation to free said temporary holding means to permit change of the angular relationship between the handle portion and the head portion,

b. said temporary holding means having engageable first and second holding elements, said first holding element being located in said handle portion and said second holding element being located in said lock bar, said holding elements being axially aligned and engaged when said lock bar is positioned in said second orientation and said second holding element being laterally displaced within said transverse bore when said lock bar is positioned in said first orientation such that said first and second holding

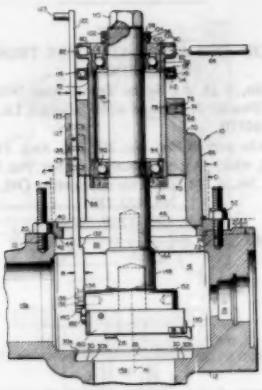
elements are laterally offset from one another and not in engagement with one another.

4,463,633

PORTABLE BORING AND REFINISHING TOOL FOR END-LOADING BALL VALVES

Ernest E. Grimsley, 4533 Wake Forest Rd., Portsmouth, Va. 23703

Filed Jul. 28, 1981, Ser. No. 287,675
Int. Cl.³ B23B *5/06*
U.S. Cl. 82—4 R **6 Claims**



1. A tool for selectively boring and refinishing one or more seating surfaces in a valve body of an end-loading ball valve, said tool comprising:

a base plate adapted to be secured to a planar top surface of a valve body;

a tool housing secured to said base plate, said tool housing having an essentially cylindrical exterior surface about an axis perpendicular to said base plate, said cylindrical exterior surface having an essentially flat chord-like portion provided thereon, said tool housing further having an interior surface defining an essentially hollow interior, said interior surface being internally counter-threaded to receive an externally threaded member adapted to travel axially therein;

input drive means;

a cutter head assembly mounted on said drive means, said cutter head assembly having a tool bit mounted thereon for traversing a circular path about said axis, said cutter head assembly further comprising feed means for causing the radial displacement of said tool bit at a rate related to the circular velocity of said cutter head assembly when said feed means is engaged;

drive means for transmitting rotary power between said input drive means and said cutter head assembly;

means for adjusting the axial position of said cutter head assembly, said axial position adjustment means including said externally threaded member adapted to travel axially in said tool housing so that said cutter head assembly may be selectively lowered and raised to position said tool bit against the seating surface;

a bar member adapted to engage said feed means for causing the radial displacement of said tool bit, said bar member being selectively movable through a continuum of positions along a direction parallel to said axis, said movement of said bar member facilitating the non-engagement of said feed means when radial displacement of said tool bit is not desired and facilitating the engagement of said feed means on said axially translatable cutter head assembly when said radial displacement of said tool bit is desired;

channel-forming means secured to said essentially flat chord-like portion of said tool housing, said channel-forming means adapted to at least partially define a channel through which said bar member extends; and,

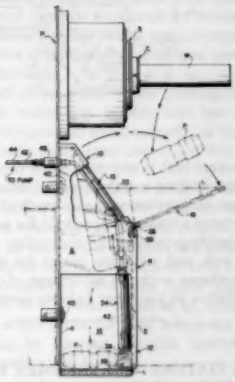
means for selectively locking said bar member in said channel.

4,463,634

PARTS CATCHER FOR AN AUTOMATIC MACHINE

Richard C. Lee, Horsehead, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed May 21, 1982, Ser. No. 380,878
Int. Cl.³ B23B *13/12, 25/00*
U.S. Cl. 82—34 R **19 Claims**



1. A finished parts catcher for an automatic machine having a work holder and parts cut-off means, comprising:

(a) a finished parts receptacle adapted to be mounted on said machine beneath said work holder having a top and bottom and having an opening in said top;

(b) said receptacle having a pivoted lid at the top thereof for covering said opening during machining operations;

(c) means disposed within said finished parts receptacle for opening and closing said lid to uncover and cover said opening after machining operation;

(d) said lid when open being positioned beneath said work holder to catch parts when finished and cut-off and having an inclined surface for directing said caught parts into said receptacle through said opening;

(e) control means associated with said lid to cause said lid to open prior to cut-off of the finished part so as to be ready to catch the finished part when cut-off;

(f) said control means includes a piston and cylinder attached to said lid for opening and closing said lid;

(g) said opening in said top extends part way of said top and the remaining part of said top is closed; and,

(h) said piston and cylinder are located in said receptacle and beneath the closed remaining part of said top.

4,463,635

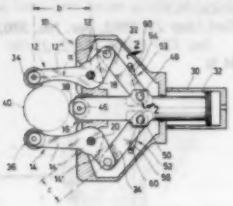
STEADY FOR HOLDING ROD-LIKE CIRCULAR CROSS-SECTION COMPONENTS

Dietmar Hafla, Hohengehren, and Herbert Illi, Ostfildern, both of Fed. Rep. of Germany, assignors to Index-Werke Komm.-Ges. Hahn & Tessky, Esslingen, Fed. Rep. of Germany

Filed Nov. 27, 1981, Ser. No. 325,602
Claims priority, application United Kingdom, Dec. 18, 1980, 8040589
Int. Cl.³ B23B *25/00*
U.S. Cl. 82—38 R **6 Claims**

1. A steady for holding a rod-shaped component of circular cross-section including three holding-members acting in a common plane, means mounting a first one of said holding-

members for linear movement toward the axis of a component to be held, the other two of said holding-members being twin-arm levers, means mounting said other two holding-members on opposite sides of said first holding-member for pivotal movement around fixed axes parallel to the axis of a component to be held, means for moving said first holding-member linearly, drive connections responsive to movement of said first holding-member for pivoting said other holding-members



in such a manner that in any position of the first holding-member the three holding-members are at substantially the same distance from said component axis, each of said drive connections comprising a rotatable eccentric for adjusting the associated other holding-member by swivelling the same about its fixed pivot axis, and actuating means for rotating said eccentrics in accordance with the movement of one of the holding-members relative to the other holding-members.

4,463,636

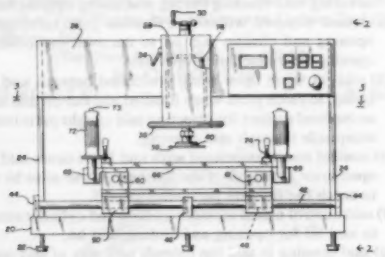
HOLDING FIXTURE AND TRIMMER FOR PC BOARDS

Martin G. Heller, 68 Harvey Dr., Short Hills, N.J. 07078; Edward Pecha, Fair Lawn, N.J.; Douglas Smith, Pompton Lakes, N.J., and Joel Rudder, Rockaway, N.J., assignors to Martin G. Heller, Short Hills, N.J.

Filed Feb. 25, 1982, Ser. No. 352,111

Int. Cl.³ B26D *1/00*

U.S. Cl. 83—13 **40 Claims**



1. A method for holding and trimming the upper face of a PC board which includes the steps of:

(a) providing a base support including a plate member;

(b) mounting an X and Y motion mechanism on said base plate member with said mechanism movable in a prescribed plane above said plate, this mechanism movable by operator manipulation and with minimal friction and effort;

(c) carrying a motor and cutting blade in a plane substantially parallel to and above the prescribed plane of the X and Y motion mechanism, said blade rotatable by said motor at a selected speed;

(d) mounting a carrier on this X and Y motion mechanism and with this carrier movable by and with the X and Y motion mechanism and establishing limits of motion of this motion mechanism as actuated by an operator;

(e) providing a safety control circuit with said mechanism to insure that a trimming step occurs only when and while the operator moves the motion mechanism in a foolproof and safe manner during manipulation, and

(f) removably mounting a holding fixture on said carrier and with this fixture having at least three upstanding side holding plates and providing in said side plates means for retaining and positioning the upper surface of said PC board or boards toward the cutting blade and in a plane that is substantially parallel to the cutting plane of the blade edge and providing means for ready retention and release of successive boards from said holding fixture.

4,463,637

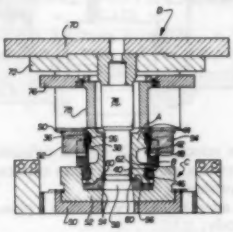
METHOD AND APPARATUS FOR TRIMMING FORGINGS

Ralph D. Delio, R.D. #1 Susan Trace, New Wilmington, Pa. 16142, and Donald J. Diemer, 4355 Brendan La., North Olmsted, Ohio 44070

Continuation-in-part of Ser. No. 297,741, Aug. 31, 1981, Pat. No. 4,425,779, which is a continuation of Ser. No. 002,851, Jan. 12, 1979, Pat. No. 4,294,101. This application Oct. 7, 1982, Ser. No. 433,229

Int. Cl.³ B26F *1/14*

U.S. Cl. 83—40 **20 Claims**



1. A method for concurrently trimming flashings from an outer surface and an internal bore of a forging, the method comprising:

receiving the forging in a split ring;

positioning the split ring and forging on a nest member assembly with the forging bore substantially perpendicular thereto;

moving a punch through the forging bore while engagement between the forging and the split ring is provided, whereby enlargement of a central portion of the forging from the interaction between the punch and forging is restrained; and,

trimming the outer forging flashing with a trim die which moves concurrently with the punch using an outer surface of the split ring as a guide, whereby the concurrent trimming of the outer forging flashing and bore flashing restrains the forging from being pulled inward by the interaction of the punch and the forging bore.

4,463,638

BAND SAW

Roméo G. Fortin, 1409 Caribou St., Moose Jaw, Saskatchewan, Canada S6H 7M4

Filed Feb. 22, 1982, Ser. No. 351,006

Int. Cl.³ B27B *13/14*

U.S. Cl. 83—62.1 **1 Claim**

1. A wall-mounted bandsaw comprising:

(a) a pair of vertically spaced supports adapted to be mounted to the face of said wall;

(b) a vertically extending pin affixed to each of said supports;

(c) a frame comprising a vertical member and two spaced apart horizontal members pivotally mounted about said

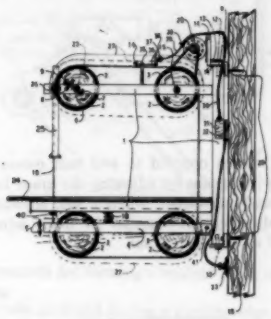
pins for horizontal swinging movement such that the frame may be pivoted from an operative position at an approximate angle to the wall and to an inoperative position approximately parallel to the wall;

(d) a pair of guide wheels mounted on one of said horizontal members;

(e) an arm pivotally mounted about an axis on said vertical member.

(f) a spring mounted between the other of said horizontal members and said arm in order to urge said arm about said axis;

(g) a pair of guide wheels mounted on said arm;



(h) an electric motor to rotationally drive one of said guide wheels;

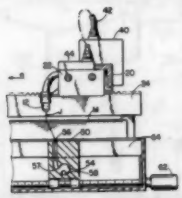
(i) an emergency power cut off switch mounted on said frame, said switch being activated by an assembly comprising an idler wheel mounted on a pivoted link, said idler wheel resting on the endless blade of said band saw, a pressure-controlled switching element abutting a second slide of the pivoted link, the aforementioned elements coacting upon the breakage of the endless blade so that said idler wheel drops under the force of gravity, causing said pivoted link to pivot, relieving pressure on said switching element, causing power to be shut off from said band saw.

4,463,639

FLUID JET RECEIVER POSITIONER

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.

Filed Jun. 22, 1982, Ser. No. 390,919
Int. Cl.³ B26F *3/00*
U.S. Cl. 83—71 **6 Claims**



1. An apparatus for cutting sheet material with a fluid jet comprising:

a cutting table having a bed defining a support surface extending in two coordinate directions for holding sheet material in a spread condition for cutting;

a carriage positioned on one side of the sheet material opposite the support surface and movable in the two coordinate directions relative to the sheet material spread on the surface of the table;

a fluid jet nozzle mounted on the carriage for movement with the carriage relative to the sheet material in the two coordinate directions and directed toward the material on the support surface;

fluid means connected with the jet nozzle for supplying pressurized fluid to the nozzle and sending a high velocity cutting jet from the nozzle through the sheet material on the support surface between a point at which the jet enters the material and a point at which the jet exits the material;

means connected to the nozzle for moving the nozzle relative to the sheet material in the two coordinate directions at various translational speeds;

a fluid jet receiver for intercepting the cutting jet exiting the sheet material and defining an inlet for the jet;

means for supporting the fluid jet receiver at the one side of the sheet material opposite the nozzle for movement of the receiver generally parallel to the support surface of the table and relative to the material in at least one of the two coordinate directions;

means connected to the receiver for moving the receiver relative to the material in at least said one of the two coordinate directions and independently of the means for moving the nozzle in the same one of the two coordinate directions; and

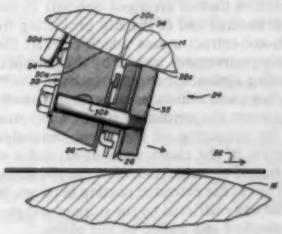
control means operatively connected to the receiver moving means for variably positioning the receiver inlet relative to the nozzle to maintain the receiver inlet in registration with the fluid jet exiting the material at a position behind the nozzle in the direction of movement in at least said one of the two coordinate directions while the nozzle is moved relative to the sheet material at various translational speeds, which cause the point where the jet exits the material to lag by varying amounts behind the point where the jet enters the material.

4,463,640

ROTARY CUTTING AND ALIGNMENT SYSTEM FOR A PRINTING PRESS

John Cogswell, Needham; Robert F. Fokos, Wayland, and Dale E. Alden, Chelmsford, all of Mass., assignors to Special Products Engineering Corporation, Needham, Mass.

Filed Dec. 29, 1981, Ser. No. 335,506
Int. Cl.³ B26D *1/62*; B27G *23/00*
U.S. Cl. 83—116 **1 Claim**



1. A rotary cutting system that makes at least one cut across a moving web with each rotation of the system comprising:

a rotatable knife cylinder,

a rotatable anvil cylinder,

said knife cylinder and anvil cylinder together defining a nip that receives said moving web,

at least one knife blade,

a knife blade holder that locates and supports said knife blade, said holder being located on the outer surface of the knife cylinder,

clamp means located on the opposite side of said blade from said blade holder,

spacer means disposed between said blae and said clamp means,

a perforator blade mounted with said spacer means and having laterally spaced apart sets of chisel-like teeth that project radially from said knife cylinder to impale a portion of said web adjacent said blade,

ejector means mounted for a radially reciprocating movement within said spacer means between a retracted position which is clear of said teeth and a raised position that removes said web portion from said teeth,

means for replaceably securing said knife blade, knife blade holder, spacer means, clamp means and perforator blade in a fixed, face-abutting relationship,

at least two circumferential grooves formed in said knife cylinder,

at least two locating members located in each of said grooves, said locating members having a registration surface,

at least two half rings structured to nest in each of said grooves, said rings each having a surface that abuts the registration surface of said at least one locating member, said rings being dimensioned so that lateral movement is restrained by said grooves and circumferential movement is restrained by said locating members, and

at least one pin mounted on said rings and projecting in a generally radial direction above the outer surface of said knife cylinder.

4,463,641

DEVICE FOR CUTTING OFF KNOTTED ENDS OF TUBE BAGS

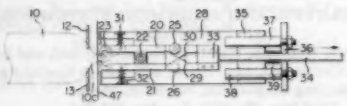
Eiichi Sato, Hayama, Japan, assignor to Osaka Kagaku Gokin Kabushiki Kaisha, Japan

Filed Mar. 3, 1982, Ser. No. 354,493

Claims priority, application Japan, Mar. 9, 1981, 56-033462

Int. Cl.³ B26D *7/14*

U.S. Cl. 83—175 **7 Claims**



1. A device for cutting off the knotted ends of tube bags comprising: an annular stopper against which the peripheral portion of a bag is pressed; pliers having claws provided at a front end portion thereof arranged opposite to the stopper for pinching the knotted end of the bag projecting from the stopper; a pinch-and-retract means which convert the early stage of its retracting movement, caused by the peripheral portion of the bag abutting against the stopper, into the pinching action of the pliers' claws and which, as soon as the pinching action is achieved, convert the remaining stage of its retracting movement into the retracting of the pliers themselves, with the pinching action of the claws maintained; and a cutting blade which is actuated by achievement of the retracting movement of the pliers to cut the extended portion between the peripheral portion of the bag restricted by the stopper and the knotted end of the bag pinched and pulled by the pliers.

4,463,642

SHEARING MACHINE

Yoshiharu Minato, and Chuo Tobita, both of Isehara, Japan, assignors to Amada Company, Limited, Kanagawa, Japan

Filed May 26, 1982, Ser. No. 382,230

Claims priority, application Japan, May 26, 1981, 56-75195[U]; May 28, 1981, 56-76595[U]

Int. Cl.³ B23D *15/12*

U.S. Cl. 83—530 **8 Claims**

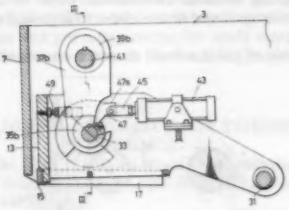
1. A shearing machine comprising:

(a) a first lower blade and a second lower blade, positioned at a right angle with respect to each other;

(b) a ram means swingably movable upwardly and downwardly with respect to said lower blades, said ram means including a first upper blade and a second upper blade positioned at a right angle with respect to each other;

(c) driving means for driving said ram means upward and downward with respect to said lower blades;

(d) connecting rod means coupling said driving means to said ram means; and



(e) adjusting means coupled to said ram means and said connecting rod means for adjusting the lower limit of the stroke of said ram means, wherein said adjusting means includes adjusting screw means for finely adjusting the lower limit of said ram means.

4,463,643

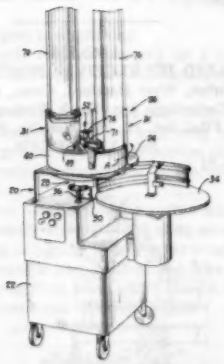
PRODUCT PUSHER FOR CUTTING APPARATUS

Louis A. Bettcher, Amherst, Ohio, assignor to Bettcher Industries, Inc., Birmingham, Ohio

Continuation-in-part of Ser. No. 172,657, Jul. 28, 1980, Pat. No. 4,334,451. This application Jun. 9, 1982, Ser. No. 386,807

Int. Cl.³ B26D *7/01*

U.S. Cl. 83—703 **14 Claims**

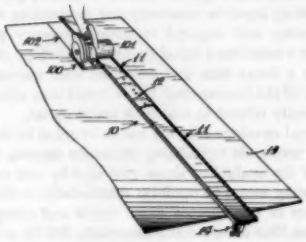


1. An improved product pusher movable along an upright receptacle that forms part of a magazine for moving a comestible product past a cutter, said pusher comprising a body movable along said receptacle, a surface movable with said body and oriented with respect thereto to extend transversely of the direction of body movement along the receptacle in use, said surface adapted to face an upper end of a comestible product in the receptacle, and a member carried with the surface, at least in part located beneath said surface and movable toward and away from the surface, and means yieldably biasing at least a part of said member to a location spaced from said surface.

4,463,644
STRAIGHT EDGE GUIDE

Irwin J. Ferdinand, Glenco; Richard Sylvan, Glenview, and Michael Peterson, Evanston, all of Ill., assignors to Hirsh Company, Skokie, Ill.

Continuation-in-part of Ser. No. 402,957, Jul. 29, 1982, abandoned, which is a division of Ser. No. 235,981, Feb. 19, 1981, Pat. No. 4,381,103. This application Jun. 2, 1983, Ser. No. 500,451
Int. Cl.³ B27B *9/04*
U.S. Cl. 83—745 9 Claims



1. Components for forming a straight edge, the components comprising:

(a) two rails, each rail having a straight edge, two ends, and a cross section defining a channel, each rail being adapted to be placed in an end-to-end butting relationship with the other rail to form a continuous straight edge;

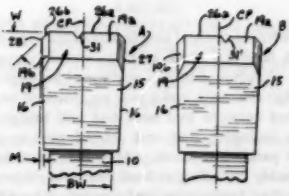
(b) a joiner plate having a arcuate cross section and a pair of lateral margins along its length, the plate being of sufficient width to permit the plate to be received in the channels of each of the two butting rails with the plate lateral margins engaging each rail within the channels and with a central region of the plate between the lateral margins being spaced upwardly from the bottom of each channel; and

(c) retaining means for engaging the plate central region under the application of force to deflect the plate central region downwardly and thereby urging the plate lateral margins outwardly against the rails so the rails are securely held together to form a rigid straight edge.

4,463,645
CIRCULAR SAW

Willy J. Goellner, Rockford, Ill., assignor to Speedcut, Inc., Rockford, Ill.

Filed Feb. 22, 1983, Ser. No. 468,452
Int. Cl.³ B23D *61/04*
U.S. Cl. 83—852 7 Claims

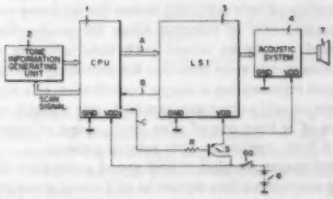


1. A circular saw having dual chip cutting action comprising, a disk-like saw blade body, a plurality of saw teeth of carbide material attached to the saw blade body at circumferentially spaced locations, all of the saw teeth being of like width and radial height and each including side faces spaced outwardly from opposite sides of the saw blade body and a top tooth face and a leading tooth face, the leading tooth face including an outer working surface disposed at a negative radial rake angle and intersecting said top tooth face along a top cutting edge, said center working surface having central portion and side portions extending symmetrically relative to the central plane of the said blade body outwardly and backwardly at a negative angle from the central portion to the side faces of the tooth, each of the saw teeth having a single notch in the top face intersecting the working surface of its leading tooth face, the notch in alternate ones of the saw teeth being disposed at one side of the central plane of the saw blade body and the notch in the other alternate ones of the saw teeth being disposed at the other side of the central plane of the saw blade body.

4,463,646
POWER SAVING APPARATUS FOR ELECTRONIC MUSICAL INSTRUMENT

Tsuyoshi Mitarai, Yokohama, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Aug. 18, 1982, Ser. No. 409,283
Claims priority, application Japan, Aug. 21, 1981, 56-130877
Int. Cl.³ G10H *1/00*
U.S. Cl. 84—1.01 7 Claims



1. A power saving apparatus for an electronic musical instrument, comprising:

a power supply unit;

a control unit arranged to be supplied with power from said power supply unit for providing signals to control operations in the instrument;

a tone information generating unit for generating tone information with respect to a tone generating operation in response to a scan signal generated from said control unit, and for supplying said tone information to said control unit wherein said control unit operates to produce control instruction signals corresponding to said tone information;

a tone generating circuit for receiving said control instruction signals from said control unit and for generating a corresponding digital tone signal;

an acoustic system for generating an analog tone signal corresponding to said digital tone signal;

a loudspeaker for generating a musical sound corresponding to said analog tone signal from said acoustic system;

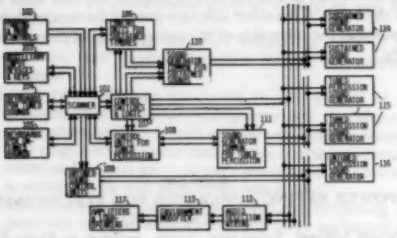
power supply control means coupled to said control unit and connected between said power supply unit and said tone generating circuit, and between said power supply unit and said acoustic system, for controlling power supply to said tone generating circuit and to said acoustic system; and

means coupled to said tone generating circuit for supplying a silent state signal to said control unit when said tone generating circuit operates in the absence of control instruction signals from said control unit, said power supply control means being controlled by said control unit according to said silent state signal.

4,463,647
MUSICAL INSTRUMENT

David A. Luce, Clarence Center, N.Y., assignor to Melville Clark, Jr., Wayland, Mass.

Continuation of Ser. No. 714,527, Aug. 16, 1976, abandoned.
This application Sep. 23, 1982, Ser. No. 420,488
Int. Cl.[3] G10H 1/00
U.S. Cl. 84—1.01 52 Claims



1. Sound generating apparatus comprising,

output means,

a plurality of sound generators coupled to said output means for providing note signals with each including means for producing any of a large common plurality of frequencies characterizing respective musical notes over at least an octave,

a plurality of note selecting means for selecting note signals characteristic of selected notes for production by said sound generators where each note selecting means includes means upon selection for providing a note selection signal representing a unique contribution to a signal waveform on said output means which note signal is representative of at least one of note pitch, speed of note selection and force applied to note selecting means,

control means coupled to said sound generators for providing continuous data signals to said sound generators representative of the selected note signals for selecting which of said sound generators coupled to said output means is to provide said note signals,

scanning means for interrogating said note selecting means to couple the selected note selection signals to said control means,

wherein each of said sound generators includes means for varying the frequencies thereof and may be associated with any note and includes means for generating the frequencies of notes at least a semitone apart and said control means includes means for associating different ones of said sound generators with each note selected by said note selecting means for controlling the frequency of an associated tone generator in accordance with that of the associated note,

said control means including fixed priority establishing means for assigning a hierarchy of priorities to said sound generators independent of the history of selection of sound generators whereby the idle sound generator with highest priority among those then idle is selected for association with the next note to be selected,

said fixed priority establishing means including means responsive to the most recent association of a sound generator with a note for providing, prior to selection of the next note by said note selecting means, a logical signal designating the particular sound generator to be associated with said next note.

50. A sound generator for creating the sound of a banjo comprising,

note selecting means for selecting sound to be generated,

a source of a peak speed signal representative of the maximum speed with which a note selecting means is actuated,

a source of a sostenuto signal for sustaining a sound after a note selecting means selecting it has been released,

a source of ungated variable frequency pulses,

decay generating means coupled to said source of ungated variable frequency pulses, said source of a sostenuto signal, and said source of a peak speed signal for providing a modulating signal of amplitude characterized by a decay time that decreases with increasing frequency of said ungated variable frequency pulses and intensity related to said peak speed signal,

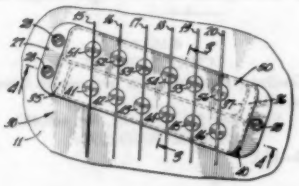
amplitude modulating means having a signal input coupled to said source of ungated variable frequency pulses and a modulating input for receiving said modulating signal for modulating said ungated variable frequency pulses to provide a modulated signal having an envelope characterized by a decay time that decreases with increasing frequency of the fundamental of the sound then selected and an intensity related to said peak speed signal,

and spectral envelope filtering means coupled to the output of said amplitude modulating means for shaping the spectrum of the modulated signal provided by said amplitude modulating means to conform substantially to that of the spectrum of the selected banjo sound and comprising a bandpass filter centered at substantially 800 Hz with a 3 db bandwidth of substantially 600 Hz.

4,463,648
ANGLED HUMBUCKING PICK-UP FOR AN ELECTRICAL MUSICAL INSTRUMENT OF THE STRINGED TYPE

C. Leo Fender, 1510 Dana Pl., Fullerton, Calif. 92635

Filed May 2, 1983, Ser. No. 490,455
Int. Cl.[3] G10H 3/18
U.S. Cl. 84—1.15 2 Claims



1. In an electrical musical instrument of the type including a body, a neck having a head, a bridge assembly connected to said body, a plurality of strings positioned between said head and said bridge assembly, and a pick-up mounted on said body and positioned between said neck and said bridge assembly, said pick-up including first and second pick-up assemblies positioned in parallel, adjacent, side-by-side relationship, each pick-up assembly including at least one pole piece and a coil wound around said pole piece, and a common housing for said first and second pick-up assemblies, the improvement wherein said first and second pick-up assemblies are longitudinally offset from each other within said housing and wherein said pick-up is mounted on said body at an obtuse angle relative to the direction of said strings, the angle of mounting of said housing on said body being a function of said longitudinal offset whereby each of said pick-up assemblies is centered under said strings.

4,463,649

WAVEFORM PRODUCING SYSTEM EMPLOYING SCANNING OF A WAVEFORM PATTERN

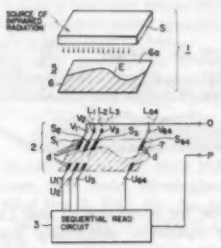
Tadao Tokushima, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Continuation of Ser. No. 415,494, Nov. 14, 1973, abandoned. This application Jun. 6, 1975, Ser. No. 584,339

Claims priority, application Japan, Nov. 17, 1972, 47-114820; Nov. 27, 1972, 47-117976; Nov. 27, 1972, 47-117979; Nov. 27, 1972, 47-117980; Nov. 27, 1972, 47-117981

Int. Cl.³ G01H *3/06, 3/08*

U.S. Cl. 84—1.18 **16 Claims**



16. A waveform producing system which comprises:

a pattern forming section comprising a magnetic flux generating source, and means for spatially distributing the magnetic field for forming a magnetic flux spatial pattern in the shape of a waveform to be produced; a conversion section comprising means for converting said magnetic flux pattern into electrical outputs which represent time-sequentially sampled amplitudes of the waveform; and a sequential read circuit for sequentially reading out the electrical outputs to produce the waveform; in which said conversion section comprises a magnetic-energy to electric-energy conversion section which comprises a substrate disposed in place on said magnetic pattern forming section and lines of magnetic-energy to electric-energy converters arranged on said substrate at intervals along the time axis of the waveform represented by said magnetic flux pattern, each of said converters comprising a plurality of magnetoresistive elements, said lines of magnetic-energy to electric-energy converters receiving magnetic flux as said magnetic flux pattern thereby producing electrical outputs which represent time-sequentially sampled amplitudes of said magnetic pattern and accordingly the waveform to be produced, said electrical output being time-sequentially read out by said sequential read circuit, said magnetic pattern forming section and said conversion section being formed into one unit.

4,463,650

SYSTEM FOR CONVERTING ORAL MUSIC TO INSTRUMENTAL MUSIC

Robert E. Rupert, P.O. Box 303, South Dennis, Mass. 02660

Filed Nov. 19, 1981, Ser. No. 322,739

Int. Cl.³ G10H *1/02*

U.S. Cl. 84—1.19 **6 Claims**

1. An electronic system for converting mouth music to instrumental music, comprising

(a) a microphone adapted to receive mouth music as as input to said system and adapted to produce analog electrical signals corresponding to said mouth music;

(b) a loudspeaker adapted to emit instrumental music as an audio output from said system;

(c) AC/DC converting means connected to said microphone for converting said input signal to direct current;

(d) an output amplifier connected to said loudspeaker and to said AC/DC converting means, the gain of said output amplifier being responsive to said direct current;

(e) wave shaping means connected to said microphone for producing pulsed signals corresponding to the fundamental frequency of said mouth music;

(f) fundamental frequency sensing means connecting said wave shaping means to said microphone;

(g) frequency multiplying means and period detecting means connected to said wave shaping means;

(h) counting means connected to said frequency multiplying means;

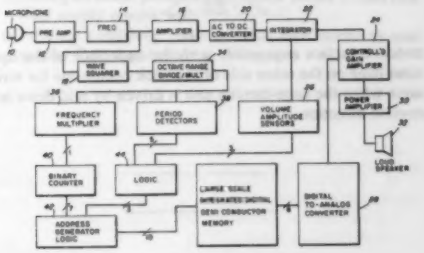
(i) logic means connected to said period detecting means;

(j) volume amplitude sensing means connected to said AC/DC converting means and to said logic means;

(k) address generator logic means connected to said counting means and to said logic means;

(l) digital memory means connected to said address generator logic means and storing a plurality of instrumental musical notes of different waveshapes in digital form therein;

(m) D/A converting means connected to said memory means and to said output amplifier;



(n) said address generator logic means having a variable addressing rate responsive to the pitch of said mouth music whereby the scanning rate of said memory means will be varied to vary the pitch of the musical notes in said memory means;

(o) said volume amplitude sensing means adapted to retrieve notes having different waveshapes stored in said memory means in response to and as a function of the amplitude of said mouth music to thereby control the timbre of the musical notes retrieved from said memory means; and

(p) octave range divider multiplier means connected between said fundamental frequency sensing means and said frequency multiplying means and said period detecting means for selectively matching the pitch of the in put to the pitch of the instrumental music;

(q) said AC/DC converting means including an integrator connected to said volume amplitude sensing means and to said output amplifier.

4,463,651

PAGE-TURNING DEVICE

Mordechai Hammer, Rechov Habonim 32, Kiryat Tivon, Israel

Filed Jun. 16, 1982, Ser. No. 389,399

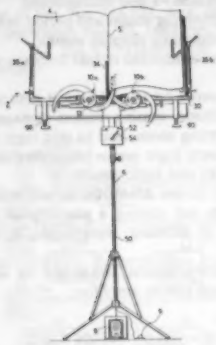
Claims priority, application Israel, Jun. 23, 1981, 63154; Mar. 3, 1982, 65155

Int. Cl.³ G10G *7/00*

U.S. Cl. 84—504 **10 Claims**

1. A page-turning device for turning the pages of a book bound along its center-line, comprising: a holder for the book; a rotatable page-turning unit supported on said holder along one horizontal edge at one side of said book center-line for individually turning the pages; and a drive for rotating said page-turning unit; characterized in that said drive is bi-directional for selectively driving said page-turning unit in either the forward direction or the reverse direction; and in that said page-turning unit includes an arm of crescent shape having an outer convex surface engageable with the underface of the

uppermost page on one side of the book center-line for turning same when the page-turning unit is driven by said drive in the forward direction, said crescent-shape arm having an inner



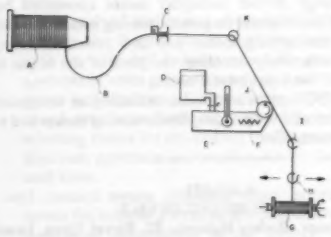
concave surface engageable with the underface of the uppermost page on the other side of the book center-line for turning same when the page-turning unit is driven by said drive in the reverse direction.

4,463,652

HIGH-SPEED BRAIDING

Pierre Monget, and Etienne Naffrechoux, both of Crepy en Valois, France, assignors to Compagnie Francaise des Isolants, Paris, France

Filed Sep. 25, 1980, Ser. No. 190,678
Int. Cl.³ D04C *1/00*
U.S. Cl. 87—1 **29 Claims**



1. A single-yarn braiding process for forming a braid from a plurality of continuous monofilament, or a plurality of continuous multifilament, inorganic, single-yarns said multifilament yarns having 300 to 400 filaments per yarn and less than 40 twists per meter, which process comprises:

(a) applying to said single-yarns a lubricant liquid selected to prevent filament breakage and fibril formation during braiding by contacting said yarns with said lubricant liquid during winding of said yarns onto braiding machine bobbins; and

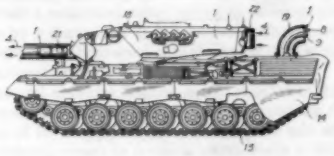
(b) machine braiding the lubricated yarns at a rate above 100 interlacings per minute to form a braid which is substantially free from fibrils projecting therefrom.

4,463,653

METHOD AND APPARATUS FOR PROTECTING VEHICLES AGAINST RECONNAISSANCE BY IR-IMAGING EQUIPMENT

Günter Pusch, Bannholzweg 12, 69o3 Neckargemünd 2, Fed. Rep. of Germany, and Alexander Hoffmann, Heidelberger Str. 24, 69o1 Mauer, Fed. Rep. of Germany

Continuation of Ser. No. 942,704, Aug. 23, 1978, abandoned. This application Jan. 21, 1981, Ser. No. 226,786
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1977, 2752729
Int. Cl.³ F41H *3/00*
U.S. Cl. 89—14.1 **8 Claims**



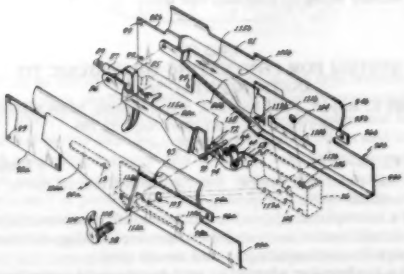
1. An arrangement for protection of land based vehicles against IR-imaging equipment comprising: means for surrounding hot or warm exhaust gases by contact with a laminar flow of cooling air flowing at the same rate as said exhaust gases; means for carrying outside air sucked in by a cooling ventilation system over thermally radiating areas of a vehicle; means for conducting said outside air to a cooling unit and to a motor for combustion; means for using part of the sucked-in outside air as said laminar flow to cover said exhaust gases; an annular fan for accelerating the surrounding outside air; and a binding cover system spaced from an outer shell of said vehicle, having channels with inner walls and a heat insulation layer coated with metallic reflection layers on said inner walls, the sucked in outside air being conducted through an intermediate space means of said blinding cover system.

4,463,654

CONVERSION KIT FOR ASSAULT RIFLE AND CONVERTED RIFLE OF COMPACT CONFIGURATION

Thomas J. Barnes, Whittier, and William H. Parry, Downey, both of Calif., assignors to Armament Research Corporation of America, Downey, Calif.

Filed Apr. 29, 1982, Ser. No. 373,248
Int. Cl.³ F41D *7/03, 11/02*
U.S. Cl. 89—128 **27 Claims**



1. A rifle converted from an original to a modified configuration, the original configuration including a barrel, a receiver including a magazine well, a spring driven hammer, a sear for locking the hammer in cocked position and a removable original trigger lever pivotable for moving said sear to thereby release said hammer against a firing pin, said modified configuration comprising:

shroud means including cam guide means secured to opposite sides of said receiver;

remote trigger means mounted to said shroud means forward of said magazine well;

replacement lever means interchangeable with said original trigger and pivotable for moving said sear out of locking engagement with said hammer;

a camming surface on said replacement lever means;

cam means captive within said guide means and movable into engagement with said camming surface for pivoting said replacement lever; and

linkage means extending along opposite sides of said receiver underneath said shroud means and operatively connecting said remote trigger means with said cam means for urging said cam means into engagement with said replacement lever means responsive to movement of said remote trigger lever;

said remote trigger means, said shroud means, said cam means and said linkage means being removable for returning said rifle to said original configuration.

4,463,655

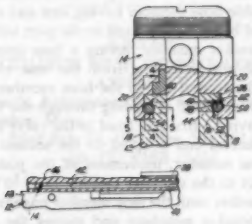
LINEAR BEARING INSERT FOR FIREARM SLIDE

Robert R. Krieger, 1958 Derby, Birmingham, Mich. 48008

Filed Dec. 6, 1982, Ser. No. 446,861

Int. Cl.³ F41C *5/06*; F41D *11/00*

U.S. Cl. 89—196 **9 Claims**



1. In a firearm having a slide member reciprocable relative to a receiver member, wherein one of said members has a linear planar groove in which is slidably engaged a corresponding linear tongue formed in the other of said members, the improvement consisting of a linear bearing insert fixedly disposed in said groove and having a portion of its peripheral surface slidably engaged in a corresponding groove formed on a side surface of said tongue.

4,463,656

PNEUMATIC MOTOR DRIVE

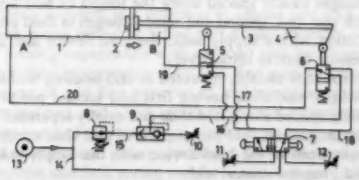
Per-Arne Mattsson, Blidsberg, Sweden, assignor to Verktygsindustrie I Blidsberg AB, Blidsberg, Sweden

Filed Jan. 13, 1982, Ser. No. 339,125

Claims priority, application Sweden, Jan. 16, 1981, 8100239

Int. Cl.³ F01B *25/04*

U.S. Cl. 91—20 **5 Claims**



1. In a drive system for a pneumatic motor of the kind comprising a housing in which a body is reciprocable between predetermined end positions while dividing the interior of the housing into two chambers alternatingly serving as fluid receiving chambers, the combination of

(A) a source of compressible driving fluid under a pressure substantially exceeding the fluid pressure required for driving the motor under its anticipated maximum load,

(B) a first fluid supply circuit connected to said source and adapted to deliver fluid therefrom at a first pressure level,

(C) a second fluid supply circuit connected to said source and adapted to deliver fluid therefrom at a second pressure level, which is lower than said first pressure level, said second circuit including a pressure reducing valve and a quick release valve connected in series,

(D) first valve means for controlling the direction of stroke of said motor, and hence, for selecting the chamber therein to receive the driving fluid, and

(E) second valve means operating in dependence of the position of said motor body within said motor housing for connecting the fluid receiving chamber of said motor

(i) during an initial phase of each motor stroke to said first fluid supply circuit, and

(ii) during a finishing phase of each such stroke to said second fluid supply circuit.

4,463,657

FLUID ACTUATOR WITH SEQUENCE-POWER VALVE

James N. Tootle, Kalamazoo, and Eugene J. Martin, Portage, both of Mich., assignors to Pneumo Corporation, Boston, Mass.

Filed Feb. 24, 1982, Ser. No. 352,046

Int. Cl.³ F15B *15/26*

U.S. Cl. 91—44 **27 Claims**

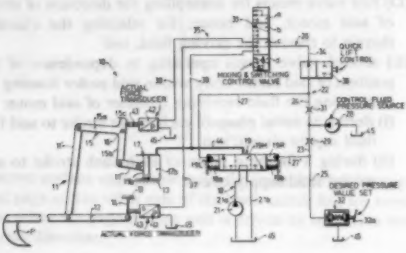
1. A fluid actuator comprising a cylinder containing a piston-rod assembly that is extendable under pressure, releasable lock means for preventing said piston-rod assembly from extending, and lock release means for releasing said lock means, said lock release means including a fluid pressure operated lock piston movable in a direction to release said lock means, and passage means which are unblocked by such lock piston movement for porting such fluid pressure directly to said actuator to cause said piston-rod assembly to extend upon release of said lock means, means for transmitting a lock release force from said lock release means to said lock means comprising a lock release lever mounted for pivotal movement, and means for causing pivotal movement of said lever during movement of said lock piston in a direction to release said lock means, means for effecting return movement of said lock piston when the fluid pressure acting on said lock piston is reduced, and means for maintaining said lever in such position for releasing said lock means during such return movement of said lock piston.

4,463,658

ARRANGEMENT FOR CONTROLLING THE LIFTING MECHANISM OF A TRACTOR OR A HARVESTER COMBINE

Joachim Heiser, Stuttgart, and Walter Kobald, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 915,067, Jun. 12, 1978, abandoned.
This application Oct. 14, 1980, Ser. No. 196,294
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1977, 2731164
Int. Cl.³ F15B *9/00, 13/042*
U.S. Cl. 91—388 24 Claims



12. A hydraulic control arrangement for positioning an implement (P) comprising

a source (21) of operating fluid under pressure;

a hydraulic positioner (17);

a pressure line connecting said source to said positioner;

a fluid-operated three-position selector valve (19) in said pressure line movable between a neutral position connecting said source to a reservoir (45) and two operating positions, in one of which said source is connected to said positioner to move the latter in one direction, and in the other of which said positioner is connected to the reservoir so as to move in said other direction.

said selector valve including spring means (19*a*, 19*b*) tending to maintain the same in said neutral position and two opposite pilot chambers for respectively moving said selector valve to either one of its operating positions;

mechanical means (11; 11', 15, 16, 11'', 12, 14) connecting said positioner to said implement (P);

a source (28) of control fluid under pressure;

a first control line (23, 27') connecting said source of control fluid to one of said pilot chambers;

a fixed throttle (29) and an operator controlled adjustable throttle (32) cooperating therewith in said first control line for producing a predetermined pressure according to the setting of said adjustable throttle, said predetermined pressure being fed to said one pilot chamber tending thereby to move said selector valve from said neutral to one of said operating positions;

and feedback means comprising

a second control line (24, 27) connecting said source (28) of control fluid to the other of said pilot chambers, and

a second fixed throttle (31) and at least one adjustable throttle (41, 42) cooperating therewith and adjusted by engagement with said mechanical means (11) operated by said positioner (17),

wherein said feedback means comprises two adjustable throttles (41, 42) cooperating with said second fixed throttle (31) and respectively adjusted by different portions (12; 11', 15, 11'') of said mechanical means, and

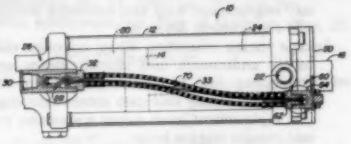
a mixing valve (33) in said second control line (24, 26) between said second fixed throttle (31) and said two adjustable throttles (41, 42) cooperating therewith and having a mixing position for mixing the feedback signals produced by said two adjustable throttles.

4,463,659

CYLINDER STROKE LIMITER

Roger J. Nelson, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Oct. 27, 1983, Ser. No. 546,338
Int. Cl.³ F15B *15/22*
U.S. Cl. 91—404 10 Claims



1. A stroke-limiting system for a hydraulic cylinder and piston unit enclosing fluid chambers on opposite sides of the piston, having a fluid port communicated with one of the chambers, and having a piston rod extending from the cylinder, the stroke limiting system including a port valve for controlling fluid flow from the port, the port valve having a housing fixed to the cylinder and having a valve member movable in the housing to control fluid flow therethrough, a stop member adjustably fixable on the piston rod and coupling means operatively coupling the stop member to the port valve, the improvement wherein the coupling means comprises:

a hollow flexible hose member having first and second ends, the first end being rigidly fixed to the port valve housing;

a movable bracket member having a base coupled to the cylinder, an arm extending from the base to an end attached to the second end of the hose member; and

a cable received by and extending through the flexible hose member, having a first end fixed to the valve member and having a second end coupled to the second end of the flexible hose member, movement of the piston and rod with respect to the cylinder causing fluid to flow out of the one chamber until the stop member engages one of the hose and bracket members and moves the end of the bracket and the second ends of the flexible hose member and cable, such movement of the second cable end causing the first cable end and the valve member to move to a position closing the port valve, blocking flow of fluid from the one chamber and preventing further movement of the piston rod.

4,463,660

MULTI-WAY VALVE

Norbert Mucheyer, Rechtenbach, and Heinz Schulte, Marktheidenfeld, both of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Lohr, Fed. Rep. of Germany

Filed Apr. 29, 1982, Ser. No. 372,848
Claims priority, application Fed. Rep. of Germany, May 14, 1981, 3119101
Int. Cl.³ F15B *13/042*
U.S. Cl. 91—469 2 Claims

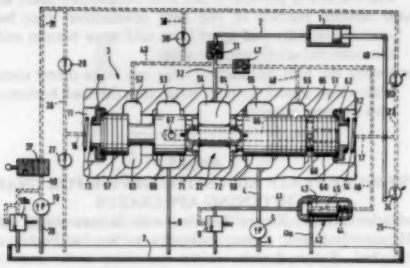
1. A multi-way valve for precisely controlling supplying pressure to a load device, comprising:

a housing having first, second and third annular, internal passages axially spaced along the length of said housing, with said first, second and third passages in fluid communication with a supply tank, the load device and a fluid pressure source, respectively;

a control slide slidably mounted in said housing within said passages, said slide having first and second piston parts axially spaced along said slide and axially separated by an annular groove, said piston parts of said slide controlling connections of the load device with the supply tank and fluid pressure source; and

restricting means for reducing the tendency of said slide to reciprocate, said restricting means being located on opposite sides of said annular groove and on ends of said first

and second piston parts and including annular collars and annular recesses with diameters greater than the diameter of said annular groove, each said annular collar having uniformly distributed cutouts on the periphery thereof, said cutouts opening and widening in a radially outward



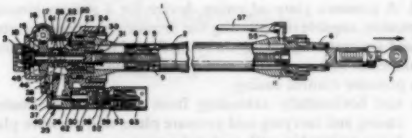
direction and extending radially inwardly to approximately the diameter of said annular groove, said cutouts extending to bases of said recesses and defining wing-like parts therebetween which extend radially outwardly to approximately the same diameter of said piston parts.

4,463,661

FLUID ACTUATOR WITH REMOTE LOCK RELEASE ASSEMBLY

James N. Tootle, Kalamazoo, Mich., assignor to Pneumo Corporation, Boston, Mass.

Filed Feb. 24, 1982, Ser. No. 352,045
Int. Cl.³ F15B *15/26*
U.S. Cl. 92—17 **20 Claims**



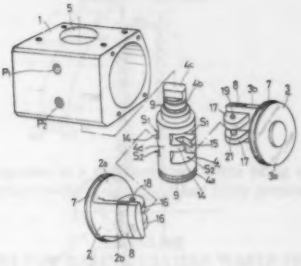
1. A fluid actuator comprising a cylinder, a piston axially movable within said cylinder, a member rotatably journaled in said cylinder and operatively connected to said piston such that axial movement of said piston effects and is dependent on rotation of said member, releaseable lock means interiorly of said actuator engageable with said member for preventing rotation of said member thereby locking said piston against movement, and lock release means mounted on one side of said actuator intermediate the ends thereof, said actuator having a port in said one side communicating with the interior of said actuator intermediate the ends thereof, and said lock release means having a lever extending through said port to the interior of said actuator for connection to said lock means, said lever being movable in a direction to release said lock means, said lock means including a first part axially movable into and out of locking engagement with a second part, said lever being movable into engagement with said first part to cause axial movement of said first part out of locking engagement with said second part, and a lock spring interposed directly between said first part and said piston, said lock spring being engageable by said piston as said piston approaches one stroke end position to compress said lock spring and force said first part into locking engagement with said second part to lock said piston against movement until released by actuation of said lock release means.

4,463,662

COMPACT ROTARY POWER CYLINDER

Yukio Okuyama, Tokyo, Japan, assignor to Aoki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 19, 1982, Ser. No. 350,338
Int. Cl.³ F01B *7/02*
U.S. Cl. 92—69 R **5 Claims**



1. An improvement in a compact rotary power cylinder, including:

a cylinder housing (1);

a torque stem (4) rotatably provided across said housing;

a pair of pistons (2, 3) slidably fitted in said housing either at both sides of said stem;

a first chamber (A) defined by said housing, said stem and both of said pistons;

a pair of second chambers (B, C) each respectively defined by said housing and either of said pistons;

a pair of impact ports (P_1, P_2) formed in said housing for alternatively supplying and releasing a pressure impact;

said ports communicating one with said first chamber and the other with said second chambers;

interlock means for interlocking said pistons to thereby rotate with said stem; and

said interlock means having a pair of slots (15) provided for said stem, a pair of engagement members (18, 19) each respectively loose-fitted in one of said slots, and a pair of fixing members (16, 17) each respectively fixing one of said engagement members to one of said pistons;

comprising:

said slots being radially cut in said stem; and

a pair of recesses (S_1, S_2) each respectively formed in said stem for accommodating therein one of said fixing members.

4,463,663

HYDRAULIC CYLINDER ASSEMBLY WITH A LIQUID RECOVERY SYSTEM

Wallace A. Hanson, Jr., and Russell B. Hanson, both of 94 Valley Hill Rd., Riverdale, Ga. 30274

Filed Sep. 29, 1982, Ser. No. 428,249
Int. Cl.³ F15B *21/04*
U.S. Cl. 92—80 **11 Claims**

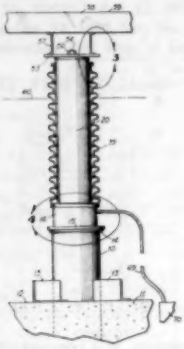
1. A hydraulic cylinder assembly of the type having an upright cylinder member with a piston rod protruding from the upper end of said cylinder member and wherein said piston rod is extended and retracted in said cylinder member and liquid within said cylinder member may leak out of said end of said cylinder member when said piston rod is moved by the hydraulic liquid, and wherein the improvement comprises:

(a) the upper end portion of said cylinder member being provided with a recess for receiving the liquid which has leaked and for confining the leaked liquid adjacent to the outer periphery of said piston rod;

(b) a compressible bellows adjacent to said piston rod, said bellows having a normal position in which the air in said bel-

lows is at ambient pressure, said bellows communicating with said recess for applying air pressure to said leaked liquid in said recess when said bellows is depressed from its normal position;

(c) means for compressing said bellows from its normal position during only a portion of the stroke of said piston rod;



(d) means for directing said leaked liquid from said recess and away from said piston rod when air pressure is applied to said leaked liquid by said air pressure; and

(e) there being provided an opening for introducing ambient air into said bellows when the pressure within said bellows has been reduced below the pressure of the ambient air.

4,463,664

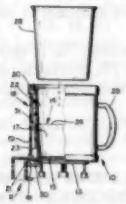
BEVERAGE WARMING APPARATUS

Paul W. Peace, P.O. Box 241, Norman Park, Ga. 31771

Continuation-in-part of Ser. No. 131,795, Mar. 20, 1980, abandoned. This application Mar. 19, 1982, Ser. No. 359,685

Int. Cl.³ A23F *3/00*

U.S. Cl. 99—323.3 **9 Claims**



1. A cup for receiving a warm beverage or the like, comprising:

a heat conductive liner including a bottom portion and a wall portion extending upwardly from said bottom portion;

a nonconductive sleeve engaging and surrounding said heat conductive liner so that heat from within the liner is poorly conducted to the sleeve;

said nonconductive sleeve being spaced apart from said bottom portion so as to expose the bottom portion for direct contact with a heat source, whereby heat is supplied from the heat source to the conductive liner and its contents;

said nonconductive sleeve comprising a nonconductive annular shell defining an open top end and an open bottom end;

said heat conductive liner having an open upper end of the wall portion mounted within said annular shell below the open top;

at least a lower portion of said heat conductive liner extending from said bottom portion upwardly toward said open upper end being spaced inwardly from said annular shell to define an open annular space between the annular shell and the lower portion of the heat conductive liner; and

said bottom portion of the heat conductive liner being spaced inwardly and apart from said open bottom end of the nonconductive annular shell,

whereby the heat conductive liner can be in direct contact with a heat source without subjecting the shell bottom end into the heat source.

4,463,665

PRESSURE PLATE ADJUSTING DEVICE FOR GRAIN WHITENING APPARATUS

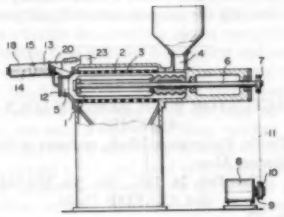
Toshihiko Satake; Kiyoto Kagawa, and Shigeru Ariji, all of Higashihiroshima, Japan, assignors to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Jul. 27, 1983, Ser. No. 517,762

Claims priority, application Japan, Dec. 10, 1982, 57-217332

Int. Cl.³ B02B *3/00, 7/02*

U.S. Cl. 99—488 **4 Claims**



1. A pressure plate adjusting device for a grain whitening apparatus, capable of adjusting the pressure of a pressure plate in said apparatus against grain being forced out of a whitening chamber in said apparatus, said device comprising:

a pressure control casing;

a rod horizontally extending from said pressure control casing and carrying said pressure plate, said pressure plate being swingable with said rod acting as axis of rotation;

a reversible electric motor mounted on said casing;

a pressure control screw shaft disposed within said casing and carried by the shaft of said motor;

a weight mounted on said screw shaft and movable forwardly or backwardly in accordance with the rotation of said motor;

a guide rod disposed within said casing for guiding the movement of said weight; and

a control unit producing a control signal having relation to the conditions of whitening action of grains within said whitening chamber and controlling the direction and the amount of rotation of said motor.

4,463,666

EGG SEPARATOR

Julius F. Papp, Lakeway, Purdys Station, N.Y. 10578

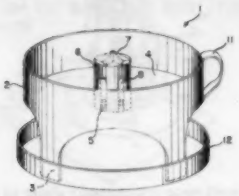
Continuation of Ser. No. 32,995, Apr. 25, 1979, abandoned. This application Dec. 16, 1982, Ser. No. 450,467

Int. Cl.³ A23J *1/09;* **A47J** *43/14*

U.S. Cl. 99—497 **5 Claims**

1. A device for simultaneously separating the egg whites and egg yolks of a plurality of eggs without causing breakage of the yolks, comprising a first component constituting a dished receptacle including a circumferential wall and a circumferentially complete annular bottom wall having a central opening and a smooth frustoconical top surface which tapers from said

circumferential wall downwardly and inwardly toward said opening; and a second component constituting an upright having a lower edge portion connected to said bottom wall circumambiently of and at the edge bounding said opening, said edge portion having at least one cutout through which the interior of said receptacle communicates with said opening and



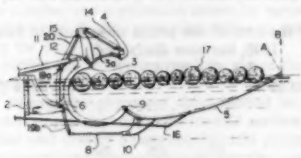
which is disposed at a level above the radially innermost portion of said top surface, the dimensions of said cutout being such that, when yolks and whites of broken eggs are placed onto the top surface of said bottom wall, the egg whites will run off along said bottom wall to and through said cutout and said opening whereas the upright will intercept unbroken yolks for subsequent removal from the interior of said receptacle.

4,463,667

LOG BUNDLING APPARATUS

Merril Jones, General Delivery, Roberts Creek, B. C., Canada V0N 2W0

Filed Aug. 30, 1982, Ser. No. 412,861
Claims priority, application Canada, Nov. 13, 1981, 390068
Int. Cl.³ B65B *13/02*
U.S. Cl. 100—2 **21 Claims**



18. A method of collecting a tier of logs floating on a body of water and lifting and rolling the tier of logs into a bundle, the method comprising extending an elongated means under the tier of logs on the water, rolling the logs together along the elongated means so that the logs roll into a closely fitting bundle of logs, and strapping the circumferences of the logs by suitable strapping means to secure the log bundle, the elongated means being pivotally mounted on a floating carrier and being constructed in at least two sections which are pivotally attached to one another, whereby the section remote from the floating carfier can be upwardly raised prior to the section proximate to the floating carrier so as to initiate log rolling action of the logs of the log tier floating on the water.

4,463,668

BALER TWINE NEEDLE WITH BREAKOFF TIP PORTION

Robert E. Jackson, Terre Hill; Leroy A. Crawford, New Holland, and Bryant F. Webb, Ephrata, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Jan. 14, 1983, Ser. No. 457,856
Int. Cl.³ B65B *13/04*
U.S. Cl. 100—24 **3 Claims**

1. A baler twine needle comprising a body portion, a tip portion detachably secured to said body portion, said tip portion having a section of reduced thickness at a selected point which is located adjacent an end of said body portion, and said tip portion being constructed so as to break off at said selected

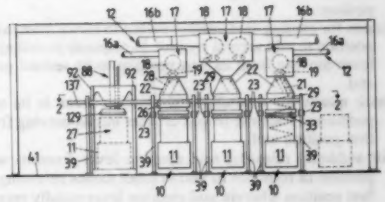
point in response to a predetermined force being exerted on said tip portion without damaging said body portion.

4,463,669

SYSTEM FOR BALING TEXTILE WASTE FROM A PLURALITY OF SOURCES

Donald W. Van Doorn; James B. Hawkins; Francis W. Carpenter, III; Wilbur G. Hudson; Tommy W. Webb; William S. Phillips; Thomas J. Tompa, and Edward Sanders, Jr., all of Columbus, Ga., assignors to Lummus Industries, Inc., Columbus, Ga.

Filed Jul. 18, 1983, Ser. No. 514,904
Int. Cl.³ B30B *15/30*
U.S. Cl. 100—43 **37 Claims**



1. A system for compressing compactable textile waste fibers and the like supplied from a plurality of separate sources into bales comprising:

(a) a plurality of fiber filling stations for receiving said fibers from said separate sources,

(b) a portable fiber receiving bin for each said filling station and adapted for movement into and out of its filling station with the upper end of each said bin being open for receiving said fibers and there being a detachable bottom platen at its lower end,

(c) a compression station adapted to receive each said bin and having a movable ram disposed for vertical reciprocatory movement selectively to an upper inoperative position and to a lower compressing position to compress said fibers within said bin to form a bale,

(d) transfer means interposed between each said filling station and said compression station for moving each said bin selectively from its filling station to said compression station and from said compression station to its filling station,

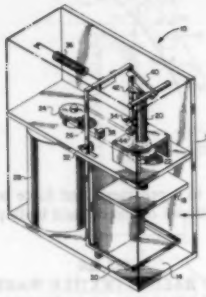
(e) means to impart relative vertical movement between said bin and platen and a support member carried by said compression station upon movement of said bin into said compression station by said transfer means, and

(f) means carried by said compression station to raise said bin and thus expose the sides of said bale with said bottom platen of said bin remaining in a lower position.

4,463,670
CAN CRUSHER

Robert C. Thomas, 1135 Princeton Dr., Richardson, Tex. 75081

Filed Nov. 5, 1982, Ser. No. 439,362
Int. Cl.³ B30B 9/32
U.S. Cl. 100—45 5 Claims



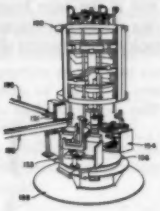
1. A can crusher comprising:
a housing having a crushing chamber with a can receiving opening disposed therein;
a bearing plate disposed within said crushing chamber;
a crusher means arranged for reciprocating movement in said crushing chamber, said crusher means movable between a first position distant from said bearing plate and a second position proximate to said bearing plate;
an ejection lever disposed within said housing and movable between a first position and a second position;
bias means for urging said ejection lever towards its first postion;
means for causing said crusher means to move from said first position to said second position in response to said ejection lever moving from its first position to its second postion; and
latch means for retaining said ejection lever in its second position in response to said crusher means moving from its first position and
for suddenly releasing said ejection lever from its second position in response to said crusher means returning to its first position wherein said ejection lever rapidly returns to its first position in response to the urging of said bias means.

4,463,671
SILK-SCREEN PRINTING METHOD AND APPARATUS

Rome R. Rudolph, deceased, late of Gibsonia, Pa.; by Kathleen Rudolph, executrix, 4113 Lee Rd., Gibsonia, Pa. 15044; Carl Strutz, and Frank C. Strutz, both of R.D. 2, Camp Trees Rd., Mars, Pa. 16046

Continuation of Ser. No. 270,869, Jun. 5, 1981, Pat. No. 4,428,283. This application Oct. 26, 1982, Ser. No. 436,922
Int. Cl.³ B41F 17/28, 17/20
U.S. Cl. 101—35 17 Claims

1. In a method of decorating a cylindrical or conical surface of a workpiece, the steps comprising:
supporting the workpiece against rotation about a support axis spaced from said surface,
oscillating said support about an oscillatory axis spaced from and generally parallel to said support axis,
positioning a squeegee on a support at one side of a decorating screen to establish line contact between the opposite side of the screen and said surface,
rolling the decorating screen along a tangential path while carried on said support about said surface and concurrently therewith,
moving the squeegee by rotatably moving said support along an orbital path about said support axis to force a printing medium through the screen onto said surface at said line of contact, and

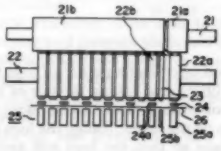


moving said workpiece continuously about an axis generally corresponding to said oscillatory axis along a path of travel while supporting the workpiece against rotation.

4,463,672
PRINTING APPARATUS HAVING STAIN PREVENTING MEANS

Mineo Nozaki, Kawasaki; Toshiaki Ozawa; Osamu Asakura, both of Tokyo; Hiroatsu Kondo, Zushi, and Shigeru Okamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 136,773, Apr. 3, 1980, abandoned, which is a continuation of Ser. No. 923,730, Jul. 11, 1978, abandoned. This application May 26, 1982, Ser. No. 382,193
Claims priority, application Japan, Jul. 11, 1977, 52-82731; Jul. 11, 1977, 52-82732; Jul. 18, 1977, 52-85840; Jul. 18, 1977, 52-85841
The portion of the term of this patent subsequent to Feb. 17, 1998, has been disclaimed.
Int. Cl.³ B41J 9/12
U.S. Cl. 101—93.09 14 Claims



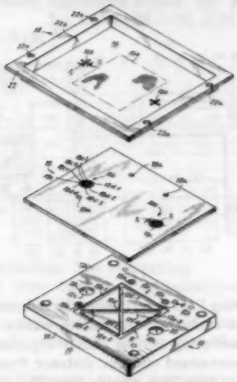
1. A printing apparatus, comprising:
at least two ink rollers positioned apart from each other, each roller applying a different color ink;
a plurality of print wheels disposed on a shaft to received ink from said ink rollers, the print wheels which received one color ink from one ink roller being separated on the shaft by a space from the print wheels which received another color ink from another ink roller
a stain preventing belt being disposed on the shaft in the space to prevent one color ink from transferring onto the print wheels having another color ink;
a shiftable stain preventing member structured to shield all but at least one type face character to be printed provided on said print wheels in the axial direction of the shaft;
means for shifting said stain preventing member reciprocally in the axial direction a distance equal to the pitch of adjacent type faces; and
hammer means for pressing the at least one type face character to be printed against a print medium.

4,463,673

METHOD AND APPARATUS FOR REGISTRATION OF PLANAR MEMBERS AND THE LIKE THROUGH THE EMPLOYMENT OF AN INTERMEDIATE ALIGNMENT SHEET

Michael Moore, 1971 Old Cuthbert Rd., Cherry Hill, N.J. 08034

Filed Sep. 8, 1981, Ser. No. 300,449
Int. Cl.³ B41M 1/12; B05C 17/06
U.S. Cl. 101—129 42 Claims



1. A method of bringing a substantially planar first member, having a registration pattern, into registration with a substantially planar second member, having locator means, through the employment of an alignment sheet, having a registration pattern, a first support having retractable locator projections and a holder for releasably holding and supporting the first planar member and registration means for movably positioning the holder and the first support relative to one another, comprising the steps of:

(a) raising the locator projections above the surface of the first support;

(b) placing the alignment sheet having locator means for receiving said projections on said surface and aligned so that said locator means receive said projections;

(c) retracting said projections so that they are removed from the alignment sheet;

(d) mounting the first planar member upon said holder;

(e) moving the holder to place the first planar member upon the top surface of the alignment sheet;

(f) operating the registration means to move said first planar member and said alignment sheet relative to one another to bring their respective registration patterns into registry;

(g) raising said holder and removing said alignment sheet to enable placement of the second planar member in registry with the first planar member by positioning the locator means of the second planar member upon said projections.

4,463,674

MOUNTING MEANS FOR A WATER UNIT TO A PRINTING PRESS

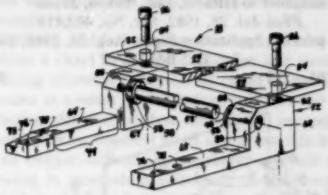
Michael T. Becker, 306 Caulder St., and William D. O'Brien, 4808 Fairview Dr., both of Des Moines, Iowa 50309

Filed Jun. 1, 1982, Ser. No. 384,104
Int. Cl.³ B41F 7/26, 7/32, 7/40; B41L 25/02
U.S. Cl. 101—148 17 Claims

1. A mounting bracket for a dampening system water unit, which replaces a conventional water unit which usually includes one or more molletons, which allows said dampening system water unit to be mounted on a wider range of offset printing presses, said presses having a revolving plate cylinder and inking unit, said bracket comprising:

(a) left and right mounting members of elongated shape mounted adjacent opposite ends of said revolving plate cylinder of said offset printing presses, each said mounting member having a front end and a back end, each said front end having a top water unit mounting surface, each said back end extending vertically higher than said front end and having a top shield mounting surface and side walls;

(b) connecting means disposed between said mounting members for hingeable reception of said water unit; and



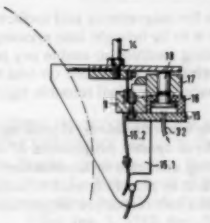
(c) L-shaped inking unit brackets connected at one end to opposite sides of said printing press and at the other end to opposite sides of an inking unit to assist in supporting said inking unit in a position adjacent to said back ends of said mounting members.

4,463,675

DOCTOR DEVICE

Ludger Ottenhues, Tecklenburg, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Nov. 30, 1981, Ser. No. 326,071
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1980, 3045191; Jan. 16, 1981, 3101300
Int. Cl.³ B41F 9/10
U.S. Cl. 101—157 3 Claims



1. A doctor device applicable to a plate cylinder comprising:

an elongated beam adapted to be fixed parallel to the surface of a plate cylinder;

an elongated doctor blade holder extending in the same direction as the beam and spaced therefrom;

a doctor blade mounted in said doctor blade holder;

at least one leaf spring pivotably connecting said beam to said doctor blade holder;

a plurality of piston-cylinder units disposed along the length of said beam;

a plurality of piston rod means, extending from said plurality of piston-cylinder units, for contacting said doctor blade holder to urge the doctor blade into an operative position against the surface of a plate cylinder;

means for feeding a pressure medium at an adjustable basic pressure to said piston-cylinder units;

fine regulating valve means associated with said piston-cylinder units and being fed with an additional pressure whereby the additional pressure can be selectively and controllably superimposed on the piston-cylinder units;

clamp means connected to said leaf spring at the end opposite to said doctor blade holder, said clamp means being seated in a complementary recess of said beam; and

locking means, locking said clamp means in said recess of

said beam, said locking means includes at least one piston-cylinder unit connected to the same pressure medium source as said plurality of piston-cylinder units.

4,463,676

PRINTING APPARATUS

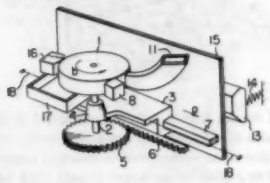
Mineo Harada, Owariasahi, and Yutaka Kako, Kasugai, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 28, 1982, Ser. No. 402,414

Claims priority, application Japan, Aug. 21, 1981, 56-131211

Int. Cl.³ B41J *3/02*

U.S. Cl. 101—212 **3 Claims**



1. A printing apparatus capable of simultaneously producing a plurality of printed copies on superimposed layers of a printing medium comprising:

(a) a platen against which a printing medium is supportable;

(b) a rotary member brought into pressing engagement with said printing medium which is supported against said platen while said rotary member is rotating, at least the surface of said rotary member to be brought into pressing engagement with said printing medium being made of magnetic material;

(c) magnetizing means for magnetizing said surface at which said rotary member is to be brought into pressing engagement with said printing medium, to enable any patterns of information to be printed to be formed on said surface as a combination of spaced individual reusable rigid printing elements;

(d) means for supplying said reusable rigid printing elements to said surface to form spaced projections of individual reusable rigid printing elements in accordance with said patterns of information by attaching each of said reusable rigid printing elements to a respective magnetized area on said surface; and

(e) means for erasing at least said magnetized areas on said surface to remove said reusable rigid printing elements attached to said magnetized areas;

said reusable rigid elements being small balls of magnetic material and said surface of said rotary member which is brought into pressing engagement with said printing medium being formed with a plurality of spheric recesses, each of said spheric recesses receiving a part of a respective one of said small balls so that a remaining part thereof projects outwardly from the respective recess.

4,463,677

METHOD AND APPARATUS FOR THE MANUFACTURE OF FRESHLY PRINTED, NUMBERED SECURITY PAPERS CUT TO FORMAT

Runwalt Kuehfuss, Metzingen, Fed. Rep. of Germany, assignor to De La Rue Giori SA, Switzerland

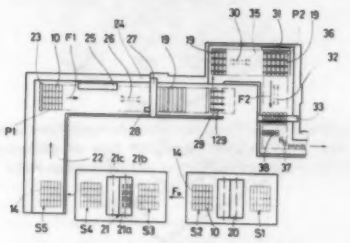
Filed Mar. 29, 1983, Ser. No. 480,071

Claims priority, application Switzerland, Apr. 8, 1982, 2195/82

Int. Cl.³ B41J *45/00*

U.S. Cl. 101—426 **9 Claims**

1. Method for the manufacture of freshly printed, numbered security papers cut to format, according to which sheets of security papers with security paper impressions arranged in the form of a matrix are printed, numbered and placed one on the other to form piles and with a step-wise feed, the piles of sheets formed in this way are cut automatically first of all into layers of strips and then into bundles of security papers, in which case the printed number or in the case of numbers printed at several points on a security paper, a number always located at the same position of the security papers is intended to be read later for control purposes automatically by a number-reading unit, whilst the security paper bears against a positioning stop by a reference edge adjacent this number, characterised in that the



position of the cutting lines determining the reference edges of all security papers is defined by cutting marks, which are applied during numbering of the sheets together with the number, at a predetermined constant distance from this number, so that these cutting lines always have the same spacing with respect to the position of the number of the respective security paper and that the length of the feed movements, which provide guidance into the cutting positions corresponding to these cutting lines, is controlled automatically as a function of the cutting marks read by a reading unit.

4,463,678

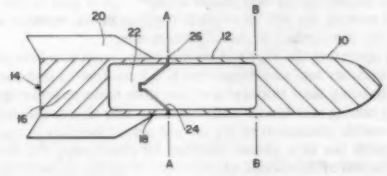
HYBRID SHAPED-CHARGE/KINETIC/ENERGY PENETRATOR

Raymond J. Weimer, Burke, and Chulho Kim, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 1, 1980, Ser. No. 132,463

Int. Cl.³ F42B *1/02*

U.S. Cl. 102—307 **11 Claims**



1. A hybrid projectile which comprises:

a nose section of high density composite material;

a cylindrical middle section in axial alignment with said nose section and joined thereto in end-to-end relationship;

said cylindrical middle section formed of a metal composite unidirectionally reinforced with continuous fibers selected from the group consisting of boron or silicon carbide;

an aft section in axial alignment with said middle section, said aft section including a solid end portion and a cylindrical portion, said cylindrical portion joined in end-to-end relationship with said cylindrical middle section;

a shaped charge confined within said cylindrical portion of said aft section;

shaped-charge liner means enclosed by said shaped charge within said cylindrical portion of said aft section; and

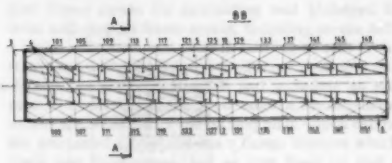
inertial fuse means confined within said solid portion of said aft section.

4,463,679

HIGH POWER PYROTECHNIC FLARE

Alain Billard, Muret, France, assignor to Etienne Lacroix Tous Artifices SA, Muret, France

Filed Apr. 19, 1982, Ser. No. 370,015
Claims priority, application France, Apr. 23, 1981, 81 08106
Int. Cl.³ F42B 4/00, 4/26
U.S. Cl. 102—336 12 Claims



10. A pyrotechnic flare comprising:

a hollow core tubular longitudinally-extending support structure;

a first pyrotechnic delay-action composition extending longitudinally within the hollow core of said support structure;

an initiator juxtaposed to said support structure to ignite said first pyrotechnic composition;

said structure support having a spaced series of through-holes extending longitudinally along and outwardly from said hollow core;

a second pyrotechnic delay-action composition extending in said through-holes; and

an illuminating pyrotechnic composition enclosing the longitudinal circumferance of said support structure radially outward from said through-holes;

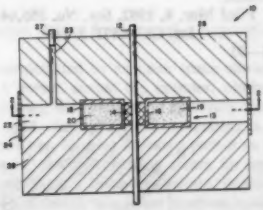
whereby said initiator ignites said first pyrotechnic composition which in turn ignites said second pyrotechnic composition which in turn ignites said illuminating pyrotechnic composition.

4,463,680

METHOD OF GENERATING SINGLE-EVENT, UNCONFINED FUEL-AIR DETONATION

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 27, 1982, Ser. No. 423,574
Int. Cl.³ F42B 13/00
U.S. Cl. 102—363 4 Claims



1. A method of initiating an unconfined detonation in an atmosphere by a single-event process, said process comprising:

(i) preparing a fuel-catalyst mixture housed in a container, said fuel-catalyst mixture comprised of from about 90 to about 98 weight percent fuel and from about 2 to about 10 weight percent of an initiating chemical catalyst when said detonation is achieved in an oxygen-sufficient atmosphere or in an oxygen-deficient atmosphere, said fuel selected from a volatile liquid of a lower molecular weight alkane or an epoxyalkane, aluminum powder, boron powder, and mixtures thereof, said initiating chemical catalyst selected from n-hexycarborane, carboranylmethyl propionate, ferrocene, and n-butylferrocene, and said fuel-catalyst mixture additionally containing an oxygen source when said detonation is achieved in an oxygen deficient atmosphere;

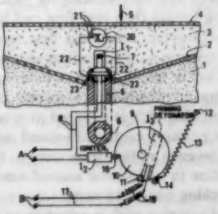
(ii) dispersing said fuel-catalyst mixture from said container to form a cloud of atomized said fuel and atomized said initiating chemical catalyst, said cloud increasing in momentum as a result of interactions between said fuel, said initiating chemical catalyst, and oxygen carried into said cloud by air entrainment when said detonation is achieved in an oxygen-sufficient atmosphere, and said cloud increasing in momentum as a result of additional interactions between said fuel, said initiating chemical catalyst, and oxygen liberated from said oxygen source when said detonation is achieved in an oxygen-deficient atmosphere, endoatmosphere or exoatmosphere said interactions catalyzed by said initiating chemical catalyst during an induction time period which is the time from the time of said dispersion to the time of the explosion of said cloud, said induction time period controlled by the amount of said initiating chemical catalyst present in said fuel-catalyst mixture, and said explosion of said cloud completing the method of unconfined detonation by said single-event process.

4,463,681

PROCEDURE OF IGNITING AN EXPLOSIVE DEVICE AND EXPLOSIVE DEVICE THUS OBTAINED

Jean-Piere Tranin, Fontenay Aux Roses, and Jean-Louis Labourdète, Bourg La Reine, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,854
Claims priority, application France, Jun. 3, 1981, 81 10994
Int. Cl.³ F42B 23/04, 23/26
U.S. Cl. 102—424 11 Claims



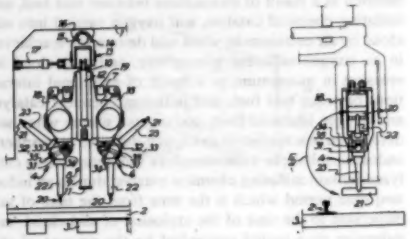
1. An explosive anti-tank influence mine device for burial in the ground comprising, a clearing charge having an electric igniter I_1 supplied with power from an igniting circuit, a formed charge as its main charge, inhibiting means which, during the passage of a predominantly metallic heavy object straight over the mine prevents the said igniter I_1 from functioning at least during a given period of time starting at an instant t_1 at which the passage of the said heavy metallic object is detected.

4,463,682

RAILWAY TRACK TAMPING MACHINE

Arne Nielsen, La Conversion, Switzerland, assignor to Sig Societe Industrielle Suisse, Neuhausen Chutes du Rhin, Switzerland

Filed Feb. 16, 1982, Ser. No. 348,972
Claims priority, application Switzerland, Feb. 24, 1981, 1199/81
Int. Cl.³ E01B 27/16
U.S. Cl. 104—12 1 Claim



1. A railway track tamping machine for tamping switches as well as open track, comprising in combination:

(a) a rolling chassis;

(b) a plurality of tamping units mounted on said rolling chassis, said stamping units being displaceable in the transverse direction of the track to tamp the track on either side of each line of rails as well as to avoid lateral obstacles upon tamping of track switches;

(c) a tool carrying frame mounted for vertical movement in each of said tamping units;

(d) two levers mounted in opposition on said tool carrying frame, said levers being articulated on the tool carrying frame for oscillating and pivotal movement in a plane parallel to the longitudinal direction of the track;

(e) a first tamping pick and a second tamping pick mounted on each of said two levers, said first and second tamping picks forming with their respective lever one tamping tool located on one side of a line of rails;

(f) a first end blade mounted respectively on each said first tamping pick and a second end blade mounted respectively on each said second tamping pick, said second end blades being longer than said first end blades;

(g) means for pivoting each said first tamping pick on its respective lever in a plane transverse to the track between a first position in which said first tamping pick is raised in non-working condition and a second position in which said first tamping pick is lowered in working condition;

(h) means for pivoting each said second tamping pick on its respective lever in a plane transverse to the track between a first position in which said second tamping pick is lowered in working condition and a second position in which said second tamping pick is raised in non-working condition,

(i) means for simultaneously immobilizing on the lever said first and second tamping picks in said first positions or in said second positions; and,

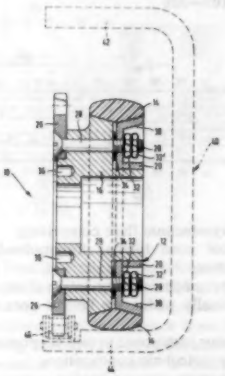
(j) means for positioning said first or second end blades of each said tamping tool that are in their respective working positions at the same relative disposition with respect to said tool carrying frame when said first tamping pick is in said second position or when said second tamping pick is in said first position.

4,463,683

RACK AND PINION DRIVE TROLLEY WITH SLIP-RING DRIVE WHEEL

Georg Uttscheid, Madronstrasse 17, 8201 Rosenheim, Fed. Rep. of Germany

Filed Jul. 9, 1982, Ser. No. 396,931
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1981, 3128824
Int. Cl.³ B61C 11/04; B60B 17/00
U.S. Cl. 105—29 R 7 Claims



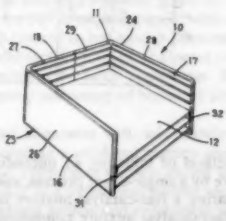
1. Motor-driven overhead trolley conveyor with a runway rail comprising horizontal sections and inclined sections and with parallel drive sections associated to the inclined rail sections and with trolleys, each of which comprises its own motor drive, which drives with equal angular velocity at least one load carrying roller rolling on the rail and at least on gear meshing with the drive sections of the rail, wherein the load carrying roller comprises a drive wheel connected with the motor drive, said load carrying roller further comprising a ring which is mounted in a slide bearing fashion on the periphery of the drive wheel so as to be rotatable but axially confined with respect to the drive wheel, said drive wheel frictionally engaging said ring whereby said ring drives the trolley along horizontal sections of the rail.

4,463,684

HORIZONTAL SHELF UNIT FOR HANDLING PAPERS

Mark C. Klungle, Park Township, Ottawa County; Charles A. Haase, Antwerp Township, Van Buren County, and Martha J. Winsche, Holland, all of Mich., assignors to Haworth, Inc., Holland, Mich.

Filed Mar. 8, 1982, Ser. No. 355,643
Int. Cl.³ A47F 3/14
U.S. Cl. 108—91 14 Claims



1. A shelving unit, comprising:

a U-shaped frame having a pair of spaced parallel legs connected by a bight, each said leg having a free end which is

remote from said bight, said frame including first and second members, each said leg of said frame being provided on a respective one of said first and second members, and including coupling means releasably interconnecting said first and second members to prevent relative movement therebetween other than in a direction which causes said free ends of said legs to relatively pivotally move toward each other;

at least one shelf removably supported between said legs for resisting movement of said legs toward each other so as to maintain said frame in a rigid U-shaped configuration;

support frame means; and

means cooperable with said U-shaped frame and said support frame means for suspending said U-shaped frame from said support frame means, including means defining a recess near each end of each said leg of said U-shaped frame and including a bracket adjacent each said recess;

each said bracket being flexible and including an arcuate plate extending along the upper edge of the associated leg of said frame, an arm fixed on said plate which extends to the associated recess and has a flange thereon which extends into such recess, and an arm fixed on said plate which extends away from said frame and has a tab on the outer end thereof which is generally perpendicular thereto and engages said support frame means.

4,463,685

PROTECTIVE DEVICE AGAINST AGGRESSIONS

Jacques Morel, 1 rue de la Montée des changes, Troyes F 10 000, France

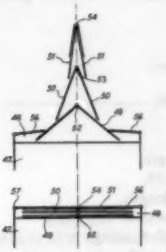
PCT No. PCT/FR81/00007, 371 Date Sep. 25, 1981, 102(e) Date Sep. 25, 1981, PCT Pub. No. WO81/02180, PCT Pub. Date Aug. 6, 1981

PCT Filed Jan. 23, 1981, Ser. No. 306,916

Claims priority, application France, Jan. 25, 1980, 80 01648

Int. Cl.³ E06B 9/02

U.S. Cl. 109—12 **24 Claims**



1. A protective device for preventing aggressions, comprising:

a counter surmounted by an open space allowing free passage of a person across the counter, closing means for rapidly closing the open space upwardly from below the counter, said closing means comprising a bullet-proof portion of a tray forming at least a part of an upper side of said counter, powerful driving means for rapidly driving said portion from a lowered position, in which it is substantially horizontal, to a raised position in which it closes said space to totally prevent passage therethrough, and thereby protect said space against bullets, wherein said portion of the tray is formed of several elements articulated separately around horizontal axles, said elements becoming arranged one after the other, seen in the vertical direction, when they are brought into raised position to close said space so that two consecutive elements, seen in the vertical direction, are not articulated on a common horizontal axle.

4,463,686

APPARATUS FOR REMOVAL OF ASH AND SLAG

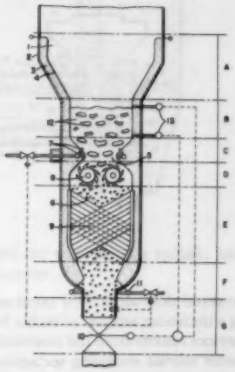
Ulrich Premel, Gummersbach, Fed. Rep. of Germany, assignor to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Oct. 5, 1983, Ser. No. 539,328

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1982, 3236753

Int. Cl.³ F23J 1/00

U.S. Cl. 110—165 R **1 Claim**



1. An apparatus for the dry removal of hot residues, resulting from a gasification of coal or carbon-containing solid material, in the lower region of a shaft-like fluid flow gasification reactor which is operated under pressure and in downward flow, includes a pressure tank wall the inside of which is lined with insulating material, and is provided with at least one cooling device; said apparatus, when viewed in the axial direction and from top to bottom, comprising seven successively arranged Zones A–G, and includes:

a wall-heating surface which extends from Zone A to Zone F, and is disposed parallel to and on the inner side of said insulation of said tank wall; said wall-heating surface has an axially-parallel tube-fin-tube construction with cooling medium circulating therethrough in counter-current and upwards flow; in Zone A, when viewed from the top toward the bottom, said wall-heating surface tapers in a funnel-like manner from a large cylindrical diameter to a small cylindrical diameter; in Zone C, said wall-heating surface has a constricted throat; in Zone D, said wall-heating surface passes over from a cylindrical cross section having the small diameter which exists prior to said constricted throat into the cross section of a four-cornered chamber, which latter cross sectional shape is maintained to Zone F;

inlet openings which are provided in and through said wall-heating surface in Zone C directly ahead of and at the narrowest part of said constricted throat for cold, clean product gas which is to be used as fluidizing and cooling gas;

a size-reducing and conveying device in the form of two cooled crushing rings which operate in opposite directions, said size-reducing and conveying device being disposed in Zone D directly after the narrowest part of said constricted throat;

convection heating surfaces located in Zone E and provided with tubes having small intervals therebetween, said convection heating surfaces being tied into said cooling medium circulation for said wall-heating surface; and

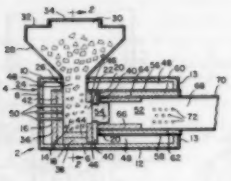
a shutoff and charging system disposed in Zone G directly below an entry region for said cooled wall-heating surface.

4,463,687

POWERED DOWNDRAFT GASIFIER

Valentine Zimmerman, Galesville, and Stephen J. Mrachek, Trempealeau, both of Wis., assignors to E. K. Industries, Inc., Galesville, Wis.

Filed Apr. 19, 1982, Ser. No. 369,666
Int. Cl.³ F23B 7/00
U.S. Cl. 110—233 7 Claims



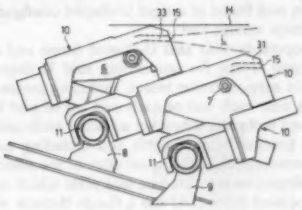
1. A powered downdraft type combustion unit capable of producing a maximum amount of usable heat for application in end use devices remote from the combustion unit including an exterior outer shroud enclosing sequential combustion chambers, at least a primary interior combustion chamber and a secondary interior combustion chamber being defined within and spaced inwardly from said shroud, said primary combustion chamber being separated from said secondary combustion chamber by a plurality of refractory grates, said combustion unit further including primary and secondary air supply means, said primary air supply means being positioned to extend through said outer shroud into said primary combustion chamber, and said secondary air supply means being positioned to extend through said outer shroud into said secondary combustion chamber, said unit further including fuel feed means extending through said outer shroud into said primary combustion chamber and combustion gas outlet means extending from said secondary combustion chamber through said outer shroud, wherein said outer shroud is substantially a right angle parallelepiped in configuration having top, bottom, front, back and side walls and including a layer of heat insulating material immediately interior to and contiguous with each of said walls; the front to back dimension of said parallelepiped being substantially greater than the top to bottom dimension of said parallelepiped; said primary combustion chamber being disposed within said shroud toward the front wall thereof and spaced inwardly from said shroud front and top walls to create an insulating air space around said primary combustion chamber, and said secondary combustion chamber being disposed within said shroud and spaced inwardly from said shroud top and bottom walls to create an insulating air space completely around said secondary combustion chamber, said secondary combustion chamber extending from said primary combustion chamber to the back wall of said shroud, said fuel feed means being positioned in the top wall of said shroud, said combustion gas outlet means being positioned in the back wall of said shroud, said primary combustion chamber, said primary air supply means, said refractory grates, said secondary combustion chamber, said secondary air supply means and said combustion gas outlet means are all positioned in the same plane, said plane being parallel to the longest dimension of said shroud; and said primary combustion chamber and said secondary combustion chamber include insulated lining means for minimizing heat loss therefrom, said insulated lining means including at least two layers of heat insulating material.

4,463,688

GRATE BLOCK FOR A REFUSE INCINERATION GRATE

Bruno Andreoli, Uerikon, Switzerland, assignor to Von Roll AG., Gerlafingen, Switzerland

Filed Apr. 15, 1983, Ser. No. 485,290
Claims priority, application Switzerland, May 13, 1982, 2999/82
Int. Cl.³ F23H 3/00
U.S. Cl. 110—298 16 Claims



1. A grate block for an incinerator grate with a plurality of partially overlapping grate blocks, the grate block comprising:

a body having a generally rectangular and planar front face, said front face having a first length, a first width and a first area;

air means coupled to said body for supplying forced air for cooling and for primary combustion means; and

a plurality of blow-out channels in said body in fluid communication with said air means, said channels conducting forced air through and out of said body, each of said channels terminating in a generally rectangular opening extending through said front face, each said opening having a second length, a second width and a second area;

in which

$L_1 \geqq L_2$,

$d_1 \geqq d_2$,

$L_1{:}L_2 < d_1{:}d_2$, and

$20 \leqq n/2F{:}n/f \leqq 40$,

where

L_1 = said first length,
L_2 = said first width,
d_1 = said second length,
d_2 = said second width,
n = number of said openings,
F = said first area, and
f = said second area;

whereby the ratio of the dimensions of the face is smaller than the ratio of the dimensions of each opening, and the ratio of half the face area to an opening area is between 20 and 40.

4,463,689

HIGH TEMPERATURE FURNACE NOSE CONSTRUCTION

Barry R. James, Apple River, Ill., assignor to Merkle Engineers, Inc., Galena, Ill.

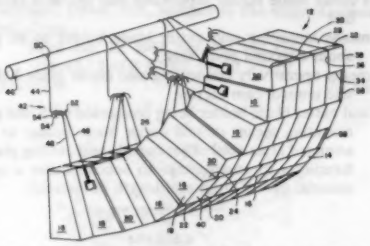
Filed Jan. 7, 1982, Ser. No. 337,846
Int. Cl.³ F23M 5/06
U.S. Cl. 110—334 10 Claims

1. In a high temperature furnace constructed of refractories, curved nose construction having its center of radius of curvature outside the cold side of said furnace and said refractories suspended from a support structure providing refractory replacement from the cold side of said refractories comprising:

a plurality of adjacent wedge-shaped refractories arranged to form a wedge row along the length of said nose, each

said wedge refractory having one set of opposing parallel sides and one set of opposing converging sides converging toward said cold side of said wedge refractory, said wedge refractories arranged with their parallel sides adjacent to form said wedge row;

a plurality of adjacent rectangular-shaped refractories arranged to form a straight row along the length of said nose, each said rectangular refractory having two sets of opposing parallel sides, one of said parallel sides adjacent one of said converging sides of at least one of said wedge refractories;



each pair of two adjacent of said wedge refractories in each said wedge row independently suspended from said support structure by suspension means and each pair of two adjacent of said rectangular refractories in each said straight row independently suspended from said support structure by suspension means, said suspension means and support structure providing space allowing removal of each of said pair of refractories from said cold side of said curved nose construction; and

a plurality of said wedge rows and a plurality of said straight rows, at least one of said straight rows adjacent each said wedge row forming said curved nose construction.

4,463,690

FURNACE CHAMBER LINING STRUCTURE

Wolfgang Hermann, Erftstadt-Gymnich; Bernhard Rüter, Königsdorf; Rainer Gorris, Ratingen, and Herbert Nowak, Meerbusch, all of Fed. Rep. of Germany, assignors to Rheinische Braunkohlenwerke AG, Cologne and Karrenh GmbH, Dusseldorf, both of, Fed. Rep. of Germany

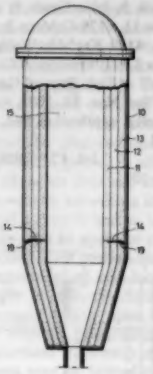
Filed Jun. 18, 1982, Ser. No. 390,144

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124263

Int. Cl.³ F23M *5/00*

U.S. Cl. 110—336 **12 Claims**

1. A lining for a furnace, which lining is generally circular in cross section and which is divided in a radial direction into at least two layers interior and exterior and in an axial direction into at least two sections including a gas seal comprised of at least two adjacent portions of thin metal material, the seal portions including a first sub-portion extending axially between the lining layers and a second sub-portion perpendicular to the first sub-portion and extending radially between the lining sections, characterized in that the seal portions are releasibly connected to form a generally continuous gas seal extending from the radial interior to the radial exterior of the lining, the first sub-portions of radially adjacent seal portions being detachably joined in an overlapping manner between adjacent



lining layers to permit the removal of a radially interior seal portion by axial movement.

4,463,691

METHOD AND APPARATUS FOR TREATING POLYCHLORINATED BIPHENYL CONTAMINATED SLUDGE

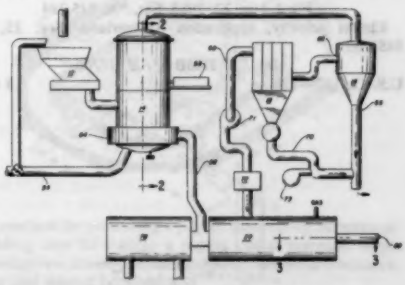
William C. Meenan, Waukegan, and George D. Sullivan, Glencoe, both of Ill., assignors to American Toxic Disposal Partners, Waukegan, Ill.

Continuation of Ser. No. 355,538, Mar. 8, 1982, Pat. No. 4,402,274. This application Mar. 28, 1983, Ser. No. 479,463

The portion of the term of this patent subsequent to Sep. 6, 2000, has been disclaimed.

Int. Cl.³ F23G *7/00*

U.S. Cl. 110—346 **17 Claims**



1. A method for treating polychlorinated biphenyl contaminated waterway bottom material comprising:

heating said material by exposure to hot gas in a separator at a temperature of from 850° to 2,500° F. thereby separating the polychlorinated biphenyls from the material; and

conveying said separated polychlorinated biphenyls out of said separator for further treatment.

4,463,692

SHUTTLE EMBROIDERY MACHINE

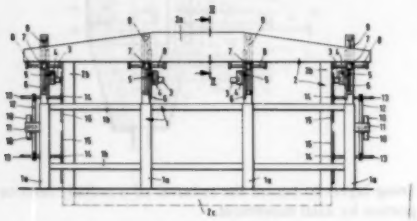
Rolf Berger, Fadheiderstrasse 51, 4156 Willich 2; Josef Bonnen, Auf der Gath 9, Meerbusch 1; Josef Haffmans, Henriette-Brey-Strasse 11, 4170 Geldern 2; Max Schäfer, Schönwasserstrasse 113, 4150 Krefeld; Wolfgang Teetz, Eilder Dyk 24, 4173 Kerken 3, and Franzjosef Gierse, Sonnenwinkel 11, 5900 Siegen 21, all of Fed. Rep. of Germany

Filed Nov. 10, 1981, Ser. No. 319,850

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1980, 3044362

Int. Cl.³ D05C *3/02*

U.S. Cl. 112—102 11 Claims



1. In a shuttle embroidery machine having an embroidery frame which in accordance with a predetermined program is displaceable at its two ends with respect to a machine frame both in vertical and in horizontal directions by separate drives, respectively, one of the drives at each of the ends being for the horizontal displacement and another of the drives being for the vertical displacement, each said drive having a motor, the rotation of which via a transmission is transmittable, as a vertical or horizontal displacement, respectively, to the embroidery frame, and cross guides permitting independent movement of the embroidery frame in the horizontal and vertical directions, respectively, the improvement comprising

at least one additional drive means for the vertical displacement of the embroidery frame, being controlled jointly with at least said drives for the vertical displacement, is arranged between the ends of the embroidery frame.

4,463,693

CUTTING ATTACHMENT FOR A SEWING MACHINE

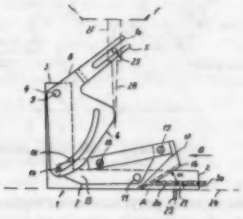
Ernst Dreier, Steckborn, and Jakob Rickenbach, Kreuzlingen, both of Switzerland, assignors to Fritz Gegauf Bernina Sewing Machine Manufacturers Limited, Steckborn, Switzerland

Filed Aug. 22, 1983, Ser. No. 525,224

Claims priority, application Switzerland, Sep. 15, 1982, 5453/82

Int. Cl.³ D05B *65/02, 37/06*

U.S. Cl. 112—128 5 Claims



1. A cutting attachment for use with a sewing machine for cutting the edges of a length of material fed to the sewing machine, said sewing machine containing a needle bar, which cutting attachment comprises:

a fixed cutter blade;

a movable cutter blade driveable by said needle bar;

said movable cutter blade coacting with said fixed cutter blade in the manner of a pair of scissors;

said movable cutter blade and said fixed cutter blade conjointly defining a cutting plane;

an articulated lever mechanism drivingly interconnecting said needle bar and said movable cutter blade;

said articulated lever mechanism comprising:

a control cam carrier containing a drive fork;

means mounting said control cam carrier to be pivotable about a first pivot axis;

a cutter blade holder supporting said movable cutter blade; and

means mounting said cutter blade holder to be pivotable about a second pivot axis;

means operatively connecting said cutter blade holder with said control cam carrier;

said cutter blade holder being connected with said pivotable mounting means of said cutter blade holder so as to be arranged at an axial offset outside said cutting plane while forming a throughpassage to accommodate a section of material cut-off from said length of material.

4,463,694

FABRIC FEED AMOUNT ADJUSTING DEVICE OF SEWING MACHINE

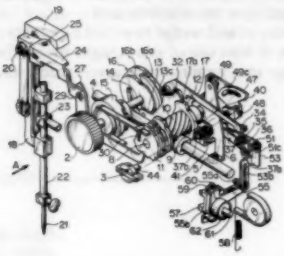
Yasuro Sano, Tokyo, Japan, assignor to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1981, Ser. No. 328,099

Claims priority, application Japan, Dec. 11, 1980, 55/17672[U]

Int. Cl.³ D05B *3/02*

U.S. Cl. 112—158 A 4 Claims



1. A fabric feed amount adjusting device for a sewing machine adapted for ordinary pattern stitching and super stitching with automatically given forward and backward fabric feeds and having a front panel carrying a pattern selecting panel, a pattern selecting dial in connection with said pattern selecting panel and a feed adjusting knob, and a machine frame with a support plate secured thereto, the device comprising means for adjusting the fabric feed amount when an ordinary stitching pattern is selected and for adjusting the fabric feed amount when a super stitching pattern is selected, said means including an operating shaft of said pattern selecting dial and a feed cam fixed on the operating shaft, and operative in such a fashion that the feed amount specified to a pattern is increased or decreased within a predetermined range defined by operating of said feed adjusting knob when an ordinary stitching pattern is selected, and an automatic feed cam for providing the amount of the forward and backward feed, said means being further operative for enlarging or reducing the feed movement in the forward and backward directions within a predetermined range defined by operating said feed adjusting knob when a super stitch pattern is selected, said means further including a first feed arm having a center portion pivotally mounted in said support plate, a selecting arm operatively

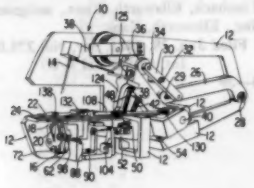
interconnected between said feed cam and said first feed arm, a second feed arm pivoted at its one end to said first feed arm, a feed adjusting arm pivotally mounted to said support plate and cooperating with a shaft of said feed adjusting knob and operatively connected to said second feed arm, said first feed arm being restrained in obliquity with respect to said second feed arm via said feed cam and selecting arm at selecting an ordinary stitch pattern.

4,463,695

FEEDING MECHANISM FOR DOUBLE POINTED LOOPER SEWING MACHINE

Karl H. Killinger, Dover, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jan. 28, 1983, Ser. No. 461,825
Int. Cl.³ D05B *57/02, 97/02, 97/10*
U.S. Cl. 112—199 **7 Claims**



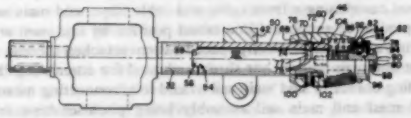
1. In a sewing machine; a frame; a sewing needle; a looper with two loop siezing points; means for moving the needle and looer so as to alternately place each of the loop seizing points in cooperative association with the needle for the formation of chain stitches; a lever movable in response to the operation of the looper; a work clamp carrier with an opening therethrough; a feed pawl operably connected to the said lever and extending through the carrier opeing wherein the pawl is movable between opposite sides thereof; a member movable by the needle moving means against the pawl while the pawl is on either side of the opening to cause the pawl to move the carrier in a direction depending upon the position of the pawl in said opening, and movable thereafter out of engagement with the pawl; and a spring which is located in the connection between said lever and feed pawl and into which energy is stored by operation of the looper while the feed pawl is engaged by said member, but from which energy is extracted to move the feed pawl across the carrier opening when the plunger is disengaged from the feed pawl.

4,463,696

SEWING MACHINE LOOPER THROW-OUT MECHANISM

Paul E. Steckenrider, Hoffman Estates, Ill., assignor to Union Special Corporation, Chicago, Ill.

Filed Mar. 22, 1982, Ser. No. 360,514
Int. Cl.³ D05B *57/32*
U.S. Cl. 112—200 **1 Claim**



1. In a sewing machine including a revoluble shaft means, reciprocal needle means, looper means adapted for cooperation with said needle means in forming chain-stitches, and a looper mechanism comprising:

a looper carrier means;

a segmented drive shaft having a first portion operatively associated with said revoluble shaft means in a manner imparting oscillatory rocking movement to the looper carrier means arranged on a second portion of said segmented shaft;

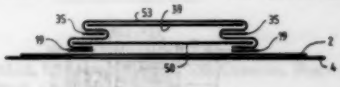
looper throw out means for bodily displacing said looper carrier means to a retracted position, said looper throw out means including means for urging the first and second portions of said drive shaft into operative association relative to one another, locking means for operatively maintaining the first and second portions of said drive shaft in an operative association, said locking means includes a plurality of radially disposed apertures in said second portion on said shaft, a groove in said first portion of said shaft, locking elements disposed in each of said apertures for radial movement between a locked position within said aperture and a groove and an unlocked position within said aperture, and an operator controlled hub arrnaged about said second shaft portion and said locking elements permitting movement of said locking elements from said locked position to said unlocked position, and operator controlled means which upon release allow movement of said hub whereby permitting the release of said first and second portions from each other such that the looper carrier means may be moved to its retracted position.

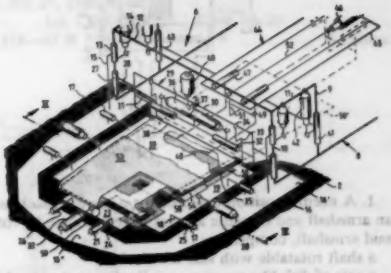
4,463,697

METHOD AND DEVICE FOR PRODUCING A POCKET ON A WORKPIECE

Siegfried Vogt; Günter Hagemeyer, both of Leopoldshöhe, and Friedrich Klöpperpieper, Bielefeld, all of Fed. Rep. of Germany, assignors to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,237
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1981, 3139223
Int. Cl.³ D05B *97/00, 35/00, 21/00*
U.S. Cl. 112—262.3 **11 Claims**





1. A method for producing a pocket comprising the steps of:

a folding step for folding a pocket cut at marginal edges having two lateral portions and a bottom portion connecting said laterial portions; and

a sewing step for attaching said folded pocket cut at said folded marginal edges to a workpiece by a stitch row, said folded pocket cut being clamped on said workpiece;

said folding step including:

a first folding step for producing a first fold at at least one of said lateral portions, and

a second folding step for producing the folding of said marginal edges,

said first fold being rebounded with respect to said folded marginal edges.

6. Apparatus for producing a pocket comprising:

a sewing machine including stitch forming means with a needle;

control means for producing said stitch row according to a predetermined contour as a relative movement between said needle and said workpiece including said pocket cut; and

means for receiving said workpieces comprising:

sword means defining said geometrical configuration of said folded pocket cut;

means for retracting said sword means out of the sewing region;

creasing means operating upon the marginal edges of said unfolded pocket cut having:

two side creasers acting upon said two lateral portions, and

a front creaser acting upon said bottom portion, and

clamping means arranged above said sword means and having a similar and smaller geometrical configuration as said sword means for clamping said folded pocket cut,

said clamping means comprising: outside edges and folder blades movably arranged below said clamping means and cooperating with said outside edges so as to form a fold at each of said lateral portions prior to the marginal edge folding of said pocket cut.

4,463,698

NEEDLE POSITION DETECTOR

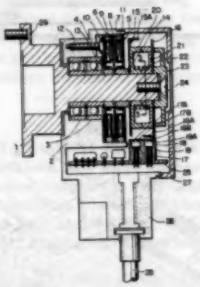
Nozomu Shinozaki; Takashi Dohi, both of Hirakata, and Shigeo Neki, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 16, 1981, Ser. No. 331,329

Claims priority, application Japan, Dec. 19, 1980, 55-180664

Int. Cl.³ D05B *69/24*

U.S. Cl. 112—275 **11 Claims**



1. A needle position detector for a sewing machine having an armshaft and a needle adaped to reciprocate by rotation of said armshaft, comprising:

a shaft rotatable with said armshaft;

a pair of disk-like members axially disposed on said shaft for unitary rotation therewith, each of said members having an optically nonreflective portion occupying a greater circumferential area and optically reflective portions occupying a smaller circumferential area, said optically reflective portions being respectively associated with the upper and lower needle positions;

a pair of light emitting elements for directing light rays respectively to said reflecting portions;

a pair of light sensitive elements for receiving light rays reflected respectively from said reflecting portions to generate signals indicative of said needle position; and slit means located on the periphery of one of the disk-like members that permits manual adjustment of the angular positions of said disk-like members so that the optically reflective portions thereof correspond respectively with the upper and lower needle positions.

4,463,699

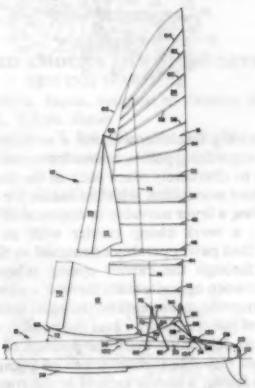
SAILING CRAFT

Donald R. Lineback, Ellsworth, Kans., assignor to Linecat Industries, Inc., Ellsworth, Kans.

Filed Jun. 28, 1981, Ser. No. 278,095

Int. Cl.³ B63H *9/00*

U.S. Cl. 114—39 **70 Claims**



1. A sailing craft comprising, in combination, at least two hulls arranged in parallel configuration and separated by a longitudinal plane positioned along the roll axis and having an interconnecting means joining the same, at least one of said hulls having a keel integrally formed therewith and positioned under a portion of the fore two-thirds of said hull, the aft portion of said hull tapering to stern section, a rudder assembly contained in the stern section of said hull with continuous curvature with respect to the taper of said hull end section, a rudder mounted in said assembly for steering said sailing craft and adapted for pivoting into and away from a steering position, a mast and main sail assembly mounted on said craft, said mast rotatably mounted on said interconnecting means and secured thereon in substantially vertical disposition by cable means comprising a front cable and cable stays, said main sail adapted to be supported in a raised position by said mast and having a series of vertically spaced battens attached thereto, at least one main sail anchor shroud adapted for connecting the trailing corner of said main sail to said interconnecting means, said mast and main sail assembly being pitch-sensitive and adapted to form variable camber adjustments and to form a concave bow therein with respect to the longitudinal plane between said hulls in response to a first, wind force exerted thereagainst and to adopt a high aspect configuration when in the concave bowed shape and adapted to straighten the bow curvature therefrom and form a camber adjustment therein at a second, lower wind velocity and to adopt a low aspect configuration when in straightened shape.

4,463,700

RUDDER FOR WATERCRAFT

Willi Becker, Hamburg, Fed. Rep. of Germany, assignor to Willi Becker Ingenieurbüro GmbH, Hamburg, Fed. Rep. of Germany

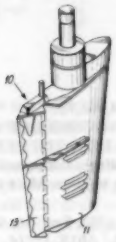
PCT No. PCT/DE81/00186, 371 Date Feb. 11, 1982, 102(e) Date Feb. 11, 1982, PCT Pub. No. WO82/01528, PCT Pub. Date May 13, 1982

PCT Filed Oct. 30, 1981, Ser. No. 349,081

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1980, 3041661

Int. Cl.³ B63H *25/06*

U.S. Cl. 114—162 4 Claims



1. Rudder for watercraft, particularly ocean-going and inland navigation vessels and for floating gear, comprising a rudder blade and a stabilizer, first articulated bushes connected to said stabilizer, second articulated bushes connected to said rudder blade, a common connecting bolt extending axially through said first and second bushes for articulating said stabilizer and said main rudder, said first and second bushes and said common connecting bolt extending in the upward direction, the improvement comprising axially aligned upwardly extending protective tubes (30,30*a*) are connected to said stabilizer with said tubes disposed in axially spaced relation and forming at least one axially extending gap (31) between the adjacent ends of said tubes, said tubes including an uppermost tube (30) and a lowermost tube (30*a*), at least one said first bush and one said second bush arranged above said uppermost tube (30), at least one said first bush and one said second bush located below said lowermost tube (30*a*) and at least one said first bush and one said second bush located in said gap (31) between said tubes (30,30*a*), a selfadjusting annular centering device is located between each of said first and second bushes located above said uppermost tube below said lowermost tube and in said gap between said tubes, each said centering device (60,60*a*,60*b*,60*c*) receives the axial weight in a free-floating manner, each said centering device comprises an upper high-grade steel torus (61) and a lower plastic torus (65), said steel torus having a lower wall surface (62) in sliding contact with an upper surface on said plastic torus (65) with the sliding surface of said steel torus and plastic torus inclined downwardly and inwardly toward the axis of said connecting bolt, said upper surface of said plastic torus has an angle of approximately 15° relative to the horizontal, said lower surface (62) of said steel torus (61) has a corresponding inclination to the horizontal, and said connecting bolt extends through said tubes (30,30*a*) and said first and second bushes (40-46, 50-53) and through said annular centering devices (60,60*a*,60*b*,60*c*), said connecting bolt comprises a series arrangement of detachable interconnectable individual bolts (70,70*b*,70*c*), and means for detachably interconnecting said bolts.

4,463,701

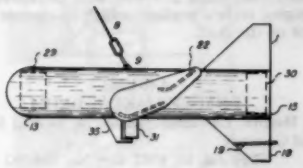
PARAVANE WITH AUTOMATIC DEPTH CONTROL

David M. Pickett, Clarksburg; Richard K. Knutson, and William VonFeldt, both of Gaithersburg, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 28, 1980, Ser. No. 125,735

Int. Cl.³ B63B *21/00*

U.S. Cl. 114—245 15 Claims



1. A towed underwater apparatus comprises:

an elongated fuselage portion;

a wing section of elongated spaced wing members attached to the fuselage, each wing member includes a convex surface and means to reduce fluid flow separation adjacent the wing members;

stability means attached to the fuselage for maintaining the fuselage lined up with the direction of tow;

a depth control flap positioned adjacent to the wing section and pivotally connected to the fuselage so that the leading edge of the flap is disposed beneath and closely adjacent to the leading edge of the wing section; and

a depth control means located within the fuselage and connected to the control flap, the depth control means is operable in response to the hydrostatic pressure for controlling the position of the control flap.

4,463,702

WARNING DEVICES

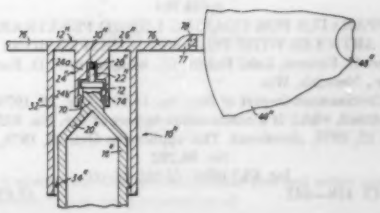
Jonathan C. Mott, Old Forge Cottage, The Common, Wonersh Near Guildford, GU5 OPJ, England

Filed Feb. 1, 1982, Ser. No. 344,639

Claims priority, application United Kingdom, Feb. 10, 1981, 8103959; Jul. 27, 1981, 8123052

Int. Cl.³ G02B *5/12*; G09F *11/23*

U.S. Cl. 116—63 R 5 Claims



1. A warning device comprising a stator, and a wind-drivable rotor which is rotatably supported on the stator to rotate, in use, about a substantially vertical axis, and which comprises a plurality of cup members which are equiangularly spaced apart about said axis and oriented to drive the rotor in response to wind, each cup member having a respective outwardly facing reflector secured therein;

wherein the rotor comprises a central hub, and mounting means for mounting each cup member on the hub in at least two substantially 180° apart angular orientations in which the cup members face in opposite directions cir-

cumferentially of the hub, to permit driving of the rotor in either of two opposite rotational directions; and

wherein the rotor is supported on the stator by a bearing comprising a vertically-extending shaft, an annular cup-like bearing member which coaxially surrounds the shaft and defines therewith a pair of spaced horizontally extending surfaces forming parts of respective ones of the stator and the rotor, and single ball bearing disposed between said horizontally extending surfaces, the internal surface of said cup-like bearing member and the external surface of said shaft being provided with circumferential inter-engaging surface portions which co-operate to hold the rotor on the shaft.

4,463,703

DRAGEE-MAKING DRUM

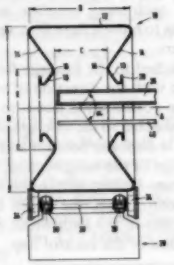
Herbert Huttlin, Lörracher Strasse 14, D-7853 Steinen, Fed. Rep. of Germany

Filed Jul. 14, 1982, Ser. No. 398,082

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1981, 3130166

Int. Cl.³ B05C *5/00*

U.S. Cl. 118—19 **10 Claims**



1. Dragee-making apparatus comprising a drum rotatable about an axis at least approximately horizontal, said drum including a substantially cylindrical shell portion and a pair of axially spaced, frustum shaped end wall portions adjoining opposite ends of said shell portion, wherein said shell portion defines a space and said frustum shape portions extend into said space, thereby being adapted to entrain material contained within said drum during rotation, and further comprising means for spraying a liquid into said drum.

4,463,704

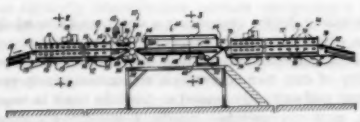
APPARATUS FOR COATING LIQUID PENETRABLE ARTICLES WITH POLYMERIC DISPERSIONS

Robert G. Farnam, Lake Forest, Ill., assignor to F. D. Farnam, Inc., Necedah, Wis.

Continuation-in-part of Ser. No. 14,991, Feb. 26, 1979, abandoned, which is a continuation-in-part of Ser. No. 933,893, Aug. 15, 1978, abandoned. This application Oct. 26, 1979, Ser. No. 88,292

Int. Cl.³ B05C *11/00, 13/00*

U.S. Cl. 118—642 **15 Claims**



1. Apparatus for continuously coating gasket parts of various sizes, shapes, thicknesses and material comprising a pre-heating station; a coating station; a drying station; a curing station; conveyor means for conveying gasket parts flat-wise successively through said pre-heating, coating, drying and curing stations; means for controlling the amount of heat delivered to the gasket parts as they travel through the pre-heating station to achieve a gasket part temperature of about 150°–250° F. at said coating station; means for applying a thin coating of a water suspension of a polymer having a coating thickness on the order of from 0.0005 to 0.005 inches to said gasket parts at said coating station; means for circulating air over the drying station; and means for varying the speed at which the gasket parts are moved through said stations.

4,463,705

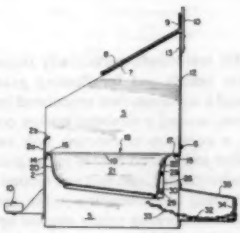
METHOD FOR TRAINING BREEDER HENS AND NEST INSTALLATION THEREFOR

Glenn O. Bressler, State College, and James B. Godshalk, Yardley, both of Pa., assignors to Ultra-Mold Corporation, Willow Grove, Pa.

Filed Jan. 27, 1983, Ser. No. 461,561

Int. Cl.³ A01K *31/14*

U.S. Cl. 119—45 R **14 Claims**



1. The method for training breeder hens to lay eggs in a roll-away nest, comprising

providing in a chicken house which has free floor space a nest installation comprising

a nest housing containing a plurality of nests disposed in a single tier near floor level, the housing having for each nest an access way which is relatively large in comparison to the size of a hen to be trained and which opens both forwardly and upwardly,

each nest comprising a nest shell conforming generally in plan elevation to the shape of a nesting hen and having a floor which slants downwardly to an exit opening through which eggs may roll to be collected;

placing litter on the floor of the chicken house and in the shells of the nests;

securing closure means across the exit openings of the nest shells to prevent escape from the nest shell of the litter therein and any eggs laid upon the litter;

confining young breeder hens in the chicken house for a maturing and training period;

collecting from each nest shell by hand the eggs laid therein during the maturing and training period;

then releasing the closure means and effecting removal of the litter from the nest shells; and

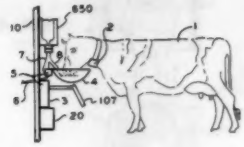
then confining the hens in the chicken house with roosters for production of fertile eggs to be laid in the nest shell and delivered via the exit openings for collection.

4,463,706

METHOD AND SYSTEM FOR MONITORING THE DISPENSING OF DRUGS OR NUTRIENTS TO ANIMALS

Jack B. Meister, Convent Station, and David W. Van Winkle, Flanders, both of N.J., assignors to J.B.M. Associates, Convent Station, N.J.

Filed May 19, 1982, Ser. No. 379,752
Int. Cl.³ A01K 7/02
U.S. Cl. 119—51 R 23 Claims



21. Apparatus for automatically administering a dose of drug or medicine to an animal or human patient in admixture with said patient's drinking water and for preventing said patient from receiving a subsequent dose of said drug or medicine until the expiration of a predetermined period of time following the administration of said first dose, comprising:

(a) a source of water from which the said patient may drink water at will in accordance with the patient's needs;

(b) a dispenser for introducing into the water a drug or medicine which will be drunk along with the water by the patient when the patient drinks said water;

(c) a first control circuit for operating said dispenser to dispense the drug or medicine therefrom into said drinking water;

(d) a second control circuit carried by said patient which when brought in proximity with said first control circuit will absorb energy from the first control circuit and thereby cause the first control circuit to operate the said dispenser and introduce into said water a predetermined dose of said drug or medicine;

(e) and means in said second control circuit for preventing said first control circuit from operating the dispenser again when the second control circuit is again brought into proximity with the first control circuit until the expiration of a predetermined period of time.

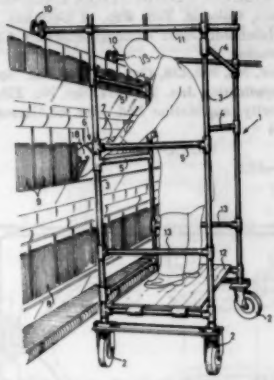
4,463,707

APPARATUS FOR PRESENTING ANIMALS, ESPECIALLY POULTRY, FOR ARTIFICIAL INSEMINATION OPERATIONS

Robert Cassou, Rue Clémenceau; Bertrand Cassou, St Symphorien des Bruyères, and Maurice Cassou, Rue Clémenceau, all of 61300 L'Aigle, France

Filed Jun. 2, 1982, Ser. No. 384,436
Claims priority, application France, Jan. 27, 1982, 82 01254
Int. Cl.³ A01K 37/00
U.S. Cl. 119—97 R 18 Claims

1. Apparatus for presenting animals for artificial insemination operations comprising a carriage for movement along a battery of cages containing the animals, grip means having a closed position for gripping hind legs of the animal and an open position for releasing the animal, locking means for releasably locking said grip means in said closed position, a guide member for juxtaposition between said grip means and a cage to support the body of an animal restrained by said grip means and to guide the animal positively toward and into a cage when released from said grip means, and mount means for mounting



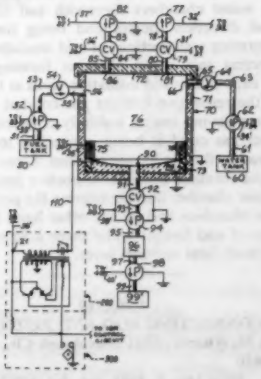
said grip means and said slide member in adjustable positions on said carriage.

4,463,708

FUEL AND WATER HOMOGENIZER

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 153,612, May 27, 1980, Pat. No. 4,324,209. This application Oct. 5, 1981, Ser. No. 308,909
Int. Cl.³ F02M 25/02
U.S. Cl. 123—25 E 19 Claims



1. A system for homogenizing liquid fuel and water components, comprising the combination of:

a chamber into which said fuel and water components are loaded in their liquid states and in predetermined quantities:

heating means, integral with said chamber, for converting said components from the liquid to the gas state, and for interspersing vaporized molecules of said components;

pressurizing means, connected to the chamber, for converting the vaporized molecules to a homogenized liquid;

a storage vessel coupled to said chamber; and

transferring means, connected between said chamber and storage vessel, for removing the homogenized liquid from the chamber and into said storage vessel.

4,463,709

EXHAUST GAS CONDUIT SYSTEM FOR MULTI-CYLINDER RECIPROCATING PISTON INTERNAL COMBUSTION ENGINES

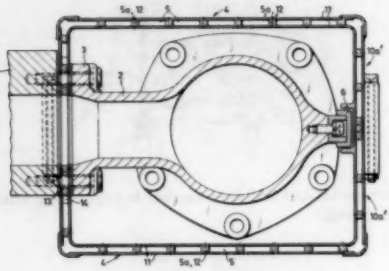
Heinz Pluequet, Cologne, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Division of Ser. No. 948,438, Oct. 4, 1978, Pat. No. 4,273,080. This application Jan. 15, 1981, Ser. No. 225,338

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1977, 2744964

Int. Cl.³ F01P *11/20*

U.S. Cl. 123—41.5 **5 Claims**



1. An exhaust gas conduit system for a multi-cylinder reciprocable piston internal combustion engine having its cylinders arranged in at least one cylinder row and respectively provided with a cylinder head and an exhaust gas conduit, in which said exhaust gas conduit respectively establishes communication between the respective cylinder and the pertaining cylinder head, and which includes water cooled insulating walls respectively surrounding said exhaust gas conduit as well as having water chambers therewith and extending in the longitudinal direction thereof and being formed by water chamber forming wall sections of said insulating walls and by ribs supporting said water chamber forming wall sections relative to each other, said insulating walls at their connecting area with the respective exhaust gas conduit being provided with recesses having inserts sealingly connected thereto, and said exhaust gas conduit being connected to the pertaining cylinder head by flanges having recesses therein, said inserts on the one hand forming with the respective insulating walls an annular water chamber interconnecting the pertaining longitudinal water chambers and on the other hand being guided in the recesses of said flanges while there is interposed therebetween an elastic heat resistant layer.

4,463,710

ENGINE CONNECTING ROD AND PISTON ASSEMBLY

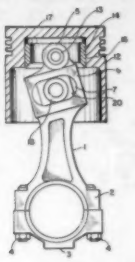
Edward M. McWhorter, 6931 Greenbrook Cir., Citrus Heights, Calif. 95610

Filed Dec. 7, 1981, Ser. No. 328,364

Int. Cl.³ F02B *75/32*

U.S. Cl. 123—48 B **3 Claims**

1. A reciprocating assembly comprising a piston and a connecting rod, said piston comprising a crown, a skirt, two bosses positioned on opposite adjacent sides of said skirt, sliding surfaces on an interior of said crown parallel to the axis of the piston, a slide slidably mounting on said sliding surfaces, two bosses positioned on opposite adjacent sides of said slide, a connecting rod comprising a large journal at one end and a small journal at an opposite end, a connecting column between said large journal and said small journal, a carrier housing positioned below said small journal on said connecting column, said carrier housing comprising an interior portion having a plurality of carrier slide surfaces located perpendicular and parallel to the carrier housing longitudinal axis, said carrier slide surfaces being inclined to the longitudinal axis of said connecting column relative to a perpendicular projection of axial centers of said large and small journals, slots on each side of said carrier housing, a pin extending transversally through said small journal and pivotally journalled at each end in said



bosses of said slide, a carrier slidably mounted on and moving parallelly along said carrier slide surfaces, a hole in the center of said carrier, a second pin journaled in said hole and extending transversally through said slots in said carrier housing and pivotally journaled in said bosses on said piston skirt.

4,463,711

CARBURETION SYSTEM FOR A V-TYPE INTERNAL COMBUSTION ENGINE

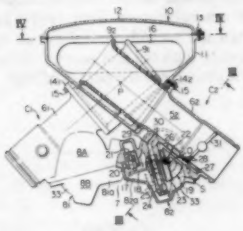
Yuichi Yoshioka, Sayama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 19, 1982, Ser. No. 409,529

Claims priority, application Japan, Aug. 19, 1981, 56-130583

Int. Cl.³ F02B *75/18, 13/00*

U.S. Cl. 123—52 MV **7 Claims**



1. In an improved carburetion system for a V-type internal combustion engine including a first carburetor and a second carburetor disposed in a space between a first cylinder and a second cylinder arranged in the form of V-shape and adapted to supply an air-fuel mixture to the respective cylinders, said carburetors each including an intake barrel defining an intake passage leading to the associated cylinder, the improvement consisting in that a common intake box having air inlet openings is provided between both the first and the second cylinders in such a manner that said first and second carburetors are connected to said common intake box, and each of said intake barrels has an inlet port which is opened toward the interior of said common intake box, said intake barrels being arranged at substantially right angles relative to the axis of the associated cylinders so that they intersect one another in a proximate relation.

4,463,712
DEVICE FOR VARYING THE VALVE TIMING OF INTERNAL COMBUSTION ENGINES IN CORRELATION TO LOAD AND SPEED

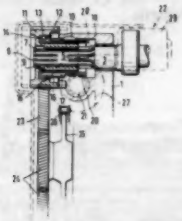
Dieter Stojek, Bergisch-Gladbach, and Gerhard Weigmann, Pulheim, both of Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 17, 1982, Ser. No. 442,323

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1981, 3146613

Int. Cl.³ F01L *1/34*

U.S. Cl. 123—90.17 **5 Claims**



1. An internal combustion engine including means for altering the valve timing as a function of load and rotational speed, the engine having a camshaft for controlling valve movement, a helical pinion mounted on the camshaft and having a straight splined connection thereto to be axially displaceable, but non-rotatable relative thereto, the helical pinion being in engagement with an axially fixed helical intermediate gearwheel driven by the engine crankshaft such that axial displacement of the pinion relative to the intermediate gearwheel produces relative rotation of the pinion and the camshaft, a control member between the pinion and the camshaft housing, the control member being axially displaceably but non-rotatably mounted relative to the housing and axially fixed relative to the pinion while permitting rotation of the pinion relative to the control member, the control member having an axially displaceable toothed rack portion, and an actuating drive arranged to axially move the toothed portion to axially displace the control member and the helical pinion to alter the valve timing and means sensitive to load and rotational speed changes of the engine for controlling movement of the toothed portion.

4,463,713
HYDRAULIC TAPPET WITH AUTOMATIC TAKING UP OF THE CLEARANCE FOR ENDOTHERMIC ENGINES

Danilo Barale, Turin, Italy, assignor to RIV-SKF Officine di Villar Perosa S.p.A., Turin, Italy

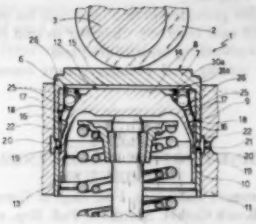
Filed Aug. 10, 1982, Ser. No. 406,857

Claims priority, application Italy, Sep. 2, 1981, 53571/81[U]

Int. Cl.³ F01L *1/24*

U.S. Cl. 123—90.55 **4 Claims**

1. A hydraulic tappet (1) with automatic take-up of the clearance for an endothermic engine and adapted to be mounted between a cam (2) fitted on a camshaft (3) and a stem (4) of a valve of the said engine, the said hydraulic tappet (1) being of the type comprising a first body (6) shaped as a socket suited to be mounted axially movable in a corresponding seat (10) formed on the head (11) of the said engine and having a side wall (9) and a wall (7) which cooperates with the cam (2); a second body (12) shaped as a socket sliding inside said socket body (6) and having a side wall (13) and a wall (14) which defines, together with the wall (7) of the first body (6) a chamber (15) the wall (14) also being in engagement with the stem (4) of the valve; the wall of the second socket body (12) having a plurality of circumferentially positioned ducts (18) connected to a corresponding seat (26) that connects with the chamber (15) with a source of liquid under pressure; and a ball (25) in each seat (26) which is adapted to intercept the liquid and which cooperates with a corresponding seat (26) formed in the wall (14) of the second socket body (12) in relation with the region in which the duct (18) leads into the chamber (15); the tappet (1) being characterized in that in the wall (14) of the second socket body (12) has an annular groove (30*a*, *b*, *c*; 40*a*,



b, *c*) adjacent the region in which the seats (26) lead into the chamber (15), and an elastically yieldable annular ring partially seated by snap fit in the annular groove (30*a*, *b*, *c*) which partly blocks the upper portion of each of the seats (26) so as to prevent the balls (25) from leaving the seat (26), while allowing its free movement inside the seat (26).

4,463,714
HYDRAULIC LIFTER

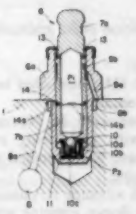
Makoto Nakamura, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 27, 1982, Ser. No. 412,100

Claims priority, application Japan, Oct. 8, 1981, 56-160603

Int. Cl.³ F01L *1/24, 1/02*

U.S. Cl. 123—90.57 **4 Claims**



1. A hydraulic clearance adjuster for a valve gear of an internal combustion engine, comprising:

a casing having a bore formed therein with a blind bottom end and a fluid passage for receiving hydraulic fluid;

plunger means slidably received in said bore of said casing, said plunger means comprising:

a hollow upper plunger member defining a first interior cavity therein and having a top end projecting from said casing, an open bottom end, a fluid inlet hole communicating said fluid passage of said casing with the interior cavity of said upper plunger member and at least one air vent hole in said upper plunger member in fluid communication with said first interior cavity which at least one air vent hole is located above said fluid inlet hole and which opens into a clearance space formed between said casing and said upper plunger member, and

a hollow lower plunger member defining a second interior cavity therein and having an open top end abutting against the open bottom end of said upper plunger member thereby defining a reservoir chamber formed by said first

and second interior cavities of said upper and lower plunger members for receiving hydraulic fluid introduced through said fluid passage of said casing and said fluid inlet hole of said upper plunger member, and a bottom end defining a pressure chamber formed between the blind bottom end of said bore of said casing and the bottom end of said lower plunger member and being formed with a feed hole communicating said reservoir chamber with said pressure chamber;

a check valve provided in said feed hole for permitting fluid flow from said reservoir chamber to said pressure chamber and preventing return flow; and

means for biasing said plunger means outwardly of said cavity.

4,463,715

OTTO ENGINE IGNITION PULSE GENERATOR AND DISTRIBUTOR

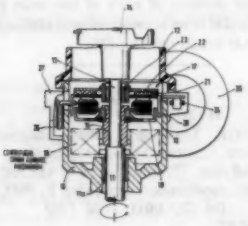
Hartmut Brammer, Vaihingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,651

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1981, 3131644

Int. Cl.³ F02P 1/00

U.S. Cl. 123—146.5 A **8 Claims**



1. Otto engine ignition pulse generator and distributor combination having

a housing (**10, 12**);

a distributor shaft (**11**) journalled in the housing and connectable to the engine;

a spark advance sleeve (**16, 36, 46**) surrounding the shaft (**11**) rotating therewith and being rotatable with respect thereto, said sleeve being located at a portion of the shaft close to the engine;

a centrifugal spark advance mechanism (**15**) coupled to the shaft and to the sleeve, rotating with the shaft and adjusting the relative angular position between the shaft and the sleeve in dependence on speed of the shaft, and positioned around the shaft at the portion thereof close to the engine;

a distributor rotor (**14**) coupled to and driven by an end portion (**13**) of the shaft, remote from the engine;

spark pulse generating means located within the housing, upwardly from said portion close to the engine, to locate the spark pulse generating means between the distributor rotor and the centrifugal spark advance mechanism;

a bearing (**11a**) journalling the shaft (**11**) in the housing at a portion close to the engine;

a vacuum diaphragm chamber (**25**) secured to the housing;

and wherein the spark pulse generating means comprises

a rotatable element (**18, 38, 43**) secured to the sleeve (**16, 36, 46**) to rotate therewith;

a non-rotatable element (**17, 37, 47, 48**);

support means (**22, 32, 45, 49**) for supporting said non-rotatable element, said support means being journalled on the shaft (**11**);

means (**24**), connected to the vacuum diaphragm chamber (**25**) and to said support means, for coupling the output of said vacuum diaphragm chamber to the support means and hence to the non-rotatable element, and to shift the non-rotatable element within the housing about the shaft (**11**),

and a bearing (**23, 33, 45**) between said support means and the shaft and journalling said support means on the shaft, positioned adjacent the end portion (**13**) of the shaft remote from the engine.

4,463,716

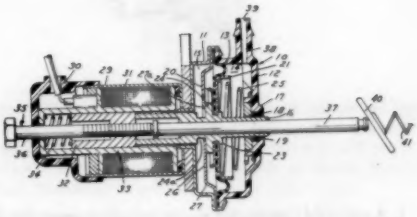
THROTTLE POSITIONING DEVICE

Charles A. Detweiler, Durand, Mich., assignor to Tom McGuane Industries, Inc., Madison Heights, Mich.

Filed Sep. 20, 1982, Ser. No. 419,740

Int. Cl.³ F02B 77/00

U.S. Cl. 123—198 DB **14 Claims**



1. A throttle positioning device comprising

a housing,

a diaphragm in said housing dividing the housing into first and second chambers,

said housing having an opening extending to said first chamber for connection to vacuum,

a solenoid associated with said housing,

said solenoid having a plunger slideable upon energization of said solenoid,

a solenoid stop,

means for connecting said solenoid stop to said diaphragm such that said stop is movable with said diaphragm,

a stem operatively connected to said plunger and extending through said movable stop to the exterior of said housing to define a movable throttle stop,

a movable throttle element engaging said stem, spring means yielding urging said throttle element in a first direction against said stem,

means yieldingly urging said diaphragm in said first direction as the stem is urged toward said plunger into a first position such that the movable solenoid stop is urged toward said solenoid such that when the solenoid is energized and vacuum is not being supplied to said first chamber, said stem is in a first position, and when said solenoid is energized and vacuum is supplied to said first chamber, said stem is moved in the opposite direction from said first direction to a second position and when the solenoid is de-energized, the throttle element can urge the stem in the first direction to a third position independent of the movement of the diaphragm to provide an anti-dieseling function.

4,463,717

VALVE STOPPING DEVICE OF INTERNAL COMBUSTION ENGINE

Makoto Ueno, Shizuoka, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 3, 1983, Ser. No. 500,991

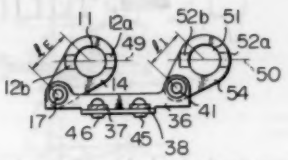
Claims priority, application Japan, Jun. 29, 1982, 57-110749

Int. Cl.³ F02D 13/06

U.S. Cl. 123—198 F **6 Claims**

1. A valve stopping device of an internal combustion engine comprising:

rocker arms rocking along with rotation of cams;
an intake valve and an exhaust valve biased in a closed direction by valve springs;
rotors rotatably attached on valve shafts of said valves and engaging and disengaging with ends of said rocker arms;
a rotor connecting means which connects said rotors with crank arms and a link mechanism for synchronized rotation of the rotors; and
a rotating means for said rotors;



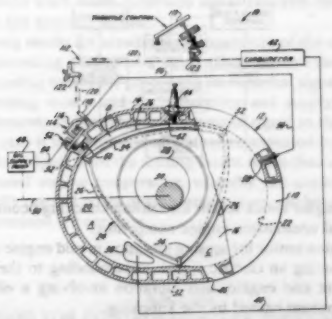
the valves operating to open and shut when the ends of said rocker arms engage with said rotors, and shutting down to a closed state when the rocker arms and the rotors disengage;
characterized in that turning angles of the rotors are set so that the turning angle of the rotor attached to the intake valve shaft is larger than that of the rotor attached to the exhaust valve shaft.

4,463,718

LUBRICANT METERING SYSTEM FOR ROTARY INTERNAL COMBUSTION ENGINE

Michael J. Griffith, Rutherford, N.J., assignor to Deere & Company, Moline, Ill.

Filed Nov. 1, 1982, Ser. No. 438,394
Int. Cl.³ F01C *21/04*
U.S. Cl. 123—242 **11 Claims**



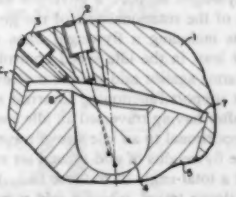
1. In a rotary internal combustion engine having a housing forming a housing cavity within which a rotor is eccentrically supported for planetary rotation and defining with the housing a plurality of working chambers which successively expand and contract in volumetric size as the rotor planetates within said housing cavity so that each working chamber goes through a compression phase of operation where gaseous fluid therein is compressed and is, therefore, at a relatively high pressure, an improved lubricant metering system comprising:
(a) a source of lubricant under pressure;
(b) a metering device having a lubricant reservoir therein connected to said source of lubricant to receive lubricant from such source and connected to pass lubricant from said lubricant reservoir to a place of use;
(c) said metering device having a pressure differential sensing element movable to vary the volumetric size of the lubricant reservoir and subject to fluid pressure in the working chambers and the lubricant reservoir and responsive to the differential fluid pressure between the fluid pressure in the working chamber and the fluid pressure in the lubricant reservoir so that during the compression phase of operation of the working chamber the pressure differential sensing element is moved to displace the lubricant in the lubricant reservoir and cause the displaced lubricant to flow to said place of use in accordance with engine speed, and
(d) stop means coacting with the pressure differential sensing element to vary the amount of lubricant passed from the lubricant reservoir in accordance with engine load.

4,463,719

AIR-COMPRESSING, SELF-IGNITING ENGINE FOR LIQUID FUEL

Franz Pischinger, Im Erkfeld 4, 5100 Aachen, Fed. Rep. of Germany, and Cornelis Havenith, Kerkrade, Netherlands, assignors to Franz Pischinger, Aachen, Fed. Rep. of Germany

Division of Ser. No. 110,710, Jan. 9, 1980, Pat. No. 4,370,958.
This application Sep. 24, 1981, Ser. No. 305,141
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1979, 2901211
Int. Cl.³ F02B *7/02*
U.S. Cl. 123—276 **10 Claims**

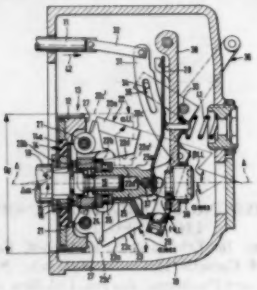


1. An air-compressing, self-igniting combustion engine having at least one piston and a cylinder axis therewith, said engine comprising:
at least one piston combustion chamber depression having an edge region as well as a wall and adapted to receive rotating combustion air during fuel injection therein;
a first injection nozzle for said combustion chamber depression adapted to inject reluctant to ignite oxygen-containing fuel predominantly in the vicinity of the wall of said depression; and
a second injection nozzle for said combustion chamber depression adapted to inject ignitible fuel therein in an overlapping relationship with the reluctant to ignite oxygen-containing fuel from said first injection nozzle, said combustion chamber depression being basically cylindrical, with its length and diameter being approximately in the ratio of 1:1, said depression being inclined with respect to the cylinder axis of said engine, said first ignition nozzle being adapted to inject reluctant to ignite fuel into a region of said inclined depression, said second injection nozzle being adapted to provide at least one stream, including at least one stream directed into said combustion chamber depression, said second injection nozzle being arranged in the edge region of said combustion chamber depression.

4,463,720
CENTRIFUGAL RPM GOVERNOR FOR FUEL INJECTED INTERNAL COMBUSTION ENGINES

Ernst Ritter, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,819
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1982, 3224358
Int. Cl.³ F02D *31/00*
U.S. Cl. 123—364 **3 Claims**



1. A centrifugal rpm governor for injected internal combustion engines, in particular idle speed-maximum speed governors for Diesel engine in vehicles which comprises: a flyweight support, flyweight stops on said support, first and second sets of angular flyweights pivotably disposed about bearing bolts, each being equally spaced bearing bolts from a rotational axis of said flyweight support, a governor sleeve movable in the direction of the rotational axis of the governor; each of said flyweights including a flyweight mass and a pressure arm which, at least in the idle speed control range lie with said pressure arms against said governor sleeve, said stops on the flyweight support functioning to arrest said first pair of flyweights after having traversed an idle speed angle of traverse (α_{LL}) proportional to an idle sleeve travel (H_{LL}), and against which the flyweights of said second set rest only after having traversed a total angle of traverse (α_{max}) proportional to the maximal sleeve travel, wherein said pressure arms of all flyweights in their rest position assume an identical initial position extending at least about vertically to the rotational axis of said governor, wherein said pressure arms have identical shapes and lengths, said stops on said flyweight support are formed identically and limit an extreme pivot position, determined by the maximally permissible centrifugal circle diameter (D_F), of all flyweights and in that the flyweight masses of the flyweights of said first set, which are only active in the idle speed control, have in their position of rest, an outer contour displaced further outwardly in comparison to the flyweight masses of said second set of flyweights, having an inclination angle (B_{LL}) to the rotational axis (A) corresponding to the idle speed angle of traverse (α_{LL}).

4,463,721
VIBRATION SUPPRESSION SYSTEM FOR DIESEL ENGINE

Yoshimasa Hayashi, Kamakura, and Kiyoshi Shimada, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

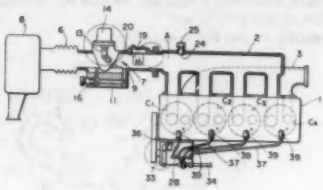
Filed Mar. 22, 1983, Ser. No. 477,742
Claims priority, application Japan, Mar. 26, 1982, 57-48382
Int. Cl.³ F02D *1/04*
U.S. Cl. 123—378 **14 Claims**

1. A system for suppressing vibration of a diesel engine, comprising:

means operable for decreasing the amount of intake air inducted into the engine;

means operable for heating the intake air;

means for detecting a low engine speed and a low engine load operating range of the engine and for producing an



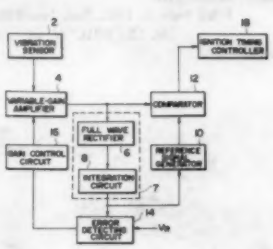
output signal when both said low engine speed and low engine load operating range are detected; and

means for simultaneously operating said intake air amount decreasing means and said intake air heating means in response to said output signal from said detecting means.

4,463,722
ENGINE KNOCK SENSOR

Tatsuo Kobayashi, Aichi, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 17, 1983, Ser. No. 476,337
Claims priority, application Japan, Oct. 5, 1982, 57-174884
Int. Cl.³ F02P *5/10*
U.S. Cl. 123—425 **13 Claims**



1. An engine knock sensor for sensing knocking occurring in an internal combustion engine comprising:

a vibration sensor for sensing vibration in said engine and for producing an electric signal corresponding to the vibration in said engine, said vibration involving a vibration component caused by the knocking;

a variable-gain amplifier the gain of which is controllable, for producing and outputting an amplified signal through an amplification of said electric signal in accordance with the controlled gain;

a mean level detecting circuit for producing and outputting a mean level signal through determining the mean value of said amplified signal;

a reference signal generator for producing and outputting a reference signal by adding a predetermined voltage to said mean level signal;

a gain controller for controlling the gain of said variable-gain amplifier in accordance with said mean level signal so as to control and maintain said amplified signal at a level equal to or above a predetermined level; and

a comparator for comparing said amplified signal with said reference signal and for producing knocking signal when the level of said amplified signal exceeds the level of said reference signal.

4,463,723

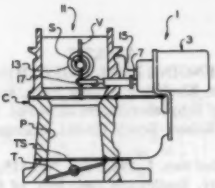
APPARATUS FOR CONTROLLABLY OPENING A CARBURETOR CHOKE VALVE

Chusak Tansuwan, St. Louis, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Apr. 1, 1982, Ser. No. 364,508

Int. Cl.³ F02M 7/06

U.S. Cl. 123—438 **14 Claims**



1. Apparatus for controllably opening the choke valve of a carburetor installed on an internal combustion engine, the carburetor having an air passage in which the choke valve is situated and the choke valve being mounted on a choke shaft movable to move the choke valve from a closed to an open position, the apparatus comprising:

actuator means to which is supplied signal elements of an electrical command signal, the actuator means being responsive to the command signal elements to move the choke shaft and open the choke valve, and the actuator means including a d.c. motor having a movable output shaft and position sensing means for sensing the position of the output shaft relative to a fixed reference as an indication of the degree of choke valve opening;

spring means connected to the actuator means and the choke shaft for exerting a choke valve opening force on the choke shaft when command signal elements are supplied to the actuator means;

sensing means for sensing the temperature of the engine and generating an electrical signal representative thereof; and,

processing means for processing an electrical signal from the sensing means and for generating and supplying signal elements of the electrical command signal to the actuator means if the engine temperature represented by the electrical signal from the sensing means is less than a predetermined engine temperature whereby the choke valve is fully opened when engine temperature reaches the predetermined temperature.

4,463,724

METHOD FOR CONTROLLING THE AIR-FUEL RATIO IN A CARBURETOR OF AN INTERNAL COMBUSTION ENGINE

Kastuyoshi Fukaya, Obu; Akira Tokuda, Nagoya, and Hitoshi Hirano, Obu, all of Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Aichi, Japan

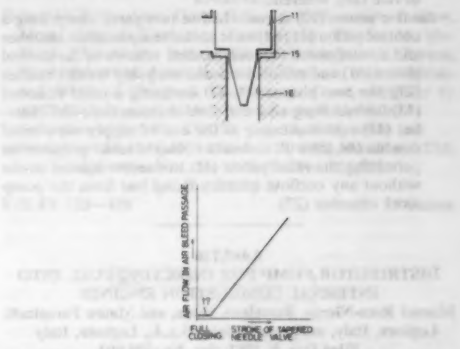
Filed Apr. 9, 1982, Ser. No. 366,989

Claims priority, application Japan, May 30, 1981, 56-082617; Jun. 24, 1981, 56-098595

Int. Cl.³ F02M 7/20

U.S. Cl. 123—438 **5 Claims**

1. A method of controlling an air-fuel ratio in a carburetor of an internal combustion engine, said carburetor having a fuel passage and an air bleed passage, said air bleed passage communicating with said fuel passage at its one end and having a tapered needle valve at its other end for controlling the amount of bleed air, said tapered needle valve being formed with a cylindrical portion at its base and being driven by a step motor, said method comprising the step of controlling said step motor so as to maintain at a constant level the minimum amount of bleed air in a substantially fully closed position of said needle



valve and to prevent the fuel from flowing through said fuel passage into said air bleed passage.

4,463,725

FUEL INJECTION DEVICE FOR INTERNAL COMBUSTION ENGINES, IN PARTICULAR A PUMP/NOZZLE FOR DIESEL ENGINES

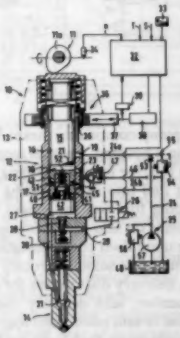
Helmut Laufer, Stuttgart, and Heinz Kuschmierz, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,806

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1981, 3145763; Jul. 2, 1982, 3224769

Int. Cl.³ F02M 57/02

U.S. Cl. 123—446 **14 Claims**



1. A fuel injection device for internal combustion engines, in particular a pump/nozzle for Diesel engines, having

a preferably mechanically actuatable pump piston (15) guided with a constant stroke in a pump cylinder (16),

a free piston (17) hydraulically driven thereby,

means defining a fluid column serving as a hydraulic push rod and enclosable within a compensation chamber (18) between the two pistons (15,17),

a valve assembly (19, 21) for controlling the volume, determining the supply onset, of the fluid column,

a control edge (22) on the free piston (17), by means of which the compensation chamber (18) can be relieved via an outflow conduit (23) in order to terminate the supply stroke of the free piston (17), and

a pump work chamber (27) communicating with the free piston (17) and via a pressure conduit (29) with an injec-

tion nozzle (14), into which chamber (27) an injection quantity of fuel withdrawn from a low-pressure fuel source (25,25',25") is pre-stored by means of a metering device (26), wherein,

the free piston (17) is embodied in two parts, comprising a control piston (41) adjacent to the compensation chamber and a relief piston (42) displaceable relative to the control piston (41) and oriented toward the pump work chamber (27), the two pistons (41, 42) enclosing a relief chamber (43) for receiving a second fluid column, the relief chamber (43) communicating at the end of supply via a relief conduit (44,45) with a chamber (46a) of lower pressure for permitting the relief piston (42) to execute a relief stroke without any outflow quantity being lost from the pump work chamber (27).

4,463,726

DISTRIBUTOR PUMP FOR INJECTING FUEL INTO INTERNAL COMBUSTION ENGINES

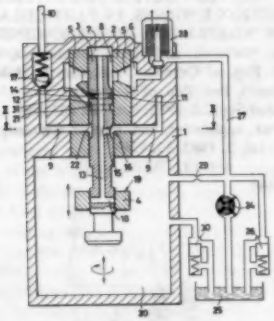
Manuel Roca-Nierga, Barcelona, Spain, and Mauro Forapianti, Leghorn, Italy, assignors to Spica S.p.A., Leghorn, Italy

Filed Dec. 9, 1981, Ser. No. 328,803

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1980, 3049366

Int. Cl.³ F02M 37/04

U.S. Cl. 123—449 4 Claims



1. An injection pump comprising means for defining a pumping chamber within a housing, a piston mounted for rotary and reciprocal motion relative to said pumping chamber, feed duct means for feeding fuel into said pumping chamber, said feed duct means including first passage means in said housing and second passage means on said piston for delivering fuel to said pumping chamber upon fluid communication being established therebetween through the selective rotary and reciprocal motion of said piston, delivery duct means for delivering fuel from said pumping chamber, said delivery duct means including third passage means in said piston and fourth passage means in said housing for delivering fuel from said pumping chamber upon fluid communication being established therebetween through the selective rotary and reciprocal motion of said piston, said piston including a pair of axially spaced circumferential channels, fifth passage means for placing said third passage means in fluid communication with a first of said pair of circumferential channels, sixth passage means for placing a second of said pair of circumferential channels in fluid communication with said fourth passage means a circumferential wall portion disposed between said first and second circumferential channels, seventh passage means in said housing for placing said first passage means in selective fluid communication with said first and second circumferential channels through the selective rotary and reciprocal motion of said piston, said first circumferential channel and said seventh passage means being in fluid communication during at least a portion of the compression stroke of said piston, and said circumferential wall portion limiting the fluid communication between said first circumferential channel and said seventh passage means to only a fraction of the reciprocal stroke of said piston.

4,463,727

DIESEL ENGINE FUEL INJECTION SYSTEM

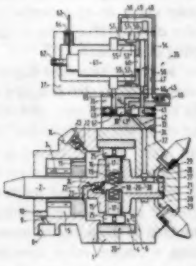
Rudolf Babitzka, Kirchberg; Walter Beck, and Walter Schlagmüller, both of Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 1, 1982, Ser. No. 415,458

Claims priority, application Fed. Rep. of Germany, Sep. 8, 1981, 3135494

Int. Cl.³ F02M 39/00

U.S. Cl. 123—458 30 Claims



1. Piezoelectric hydraulic control unit (35) in combination with a fuel injection pump (2, 22);

wherein the fuel injection pump (2, 11) has a pump chamber (20) within which fuel under injection pressure is provided;

and a pressure inlet (42) is connected to be in fluid communication (30, 31, 32) with said injection pressure pump chamber,

comprising, in accordance with the invention,

a spool valve having a spool cylinder (38) and a valve spool (39) slidable in the cylinder;

said valve spool (39) having a section (43) of reduced diameter;

a drain connection duct means (30, 32, 38, 44, 45, 46) terminating in said spool valve cylinder (38) for selective communication of the pressure inlet (42) with the drain line or blocking of said communication in dependence on the position of the valve spool;

a hydraulic housing (37) defining a fluid chamber;

a piston (53) separating said chamber into two pressure chambers (55, 56);

a piezoelectric driver element (61) coupled to said piston (53) to move the piston in the chamber and change the relative volume of the pressure chambers;

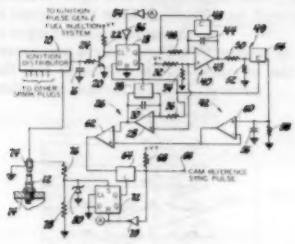
and wherein the valve spool (39) is positioned in the spool cylinder (38) to subdivide the cylinder and form two cylinder portions, each of which is in communication with a respective one of said pressure chambers (55, 56) to provide for amplified movement of the spool in the spool cylinder upon small excursions of the piston (53), under piezoelectric control by the piezoelectric element (61), and hence control the position of the spool for, selectively, blocking or drainage of fluid therefrom.

4,463,728

ENGINE SYNC PULSE GENERATOR FOR A FUEL INJECTION SYSTEM

Dennis M. Bogden, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 28, 1983, Ser. No. 479,487
Int. Cl.³ F02B 3/00
U.S. Cl. 123—475 3 Claims



1. In an internal combustion engine having multiple cylinders operated in a predetermined repeating sequence in synchronization with the rotation of a crankshaft and pursuant to a method including the steps of:

generating ignition pulses each having an engine operation dependent crankshaft angle relation to the top dead center crankshaft position of a respective one of the cylinders;

distributing the ignition pulses to the respective cylinders in the predetermined sequence,

generating timing reference pulses each having a predetermined crankshaft angle relation to the top dead center position of a respective one of the cylinders,

injecting fuel to the respective cylinders in the predetermined sequence in response to the timing reference pulses, and

generating a sync pulse having a predetermined crankshaft angle relation to the top dead center crankshaft position of a designated one of the cylinders for the purpose of synchronizing the fuel injection sequence with the ignition pulse distribution sequence, the improvement comprising a method of timing the generation of the sync pulse including the steps of:

generating offset signals each having a predetermined crankshaft angle relation to a respective one of the timing reference pulses such that each offset signal has the same predetermined crankshaft angle relation to the top dead center position of a different associated one of the cylinders as the crankshaft angle relation required between the sync pulse and the top dead center crankshaft position of the designated cylinder, and such that each offset signal occurs after the occurrence of the ignition pulse for the associated cylinder;

sensing the occurrence of an ignition pulse distributed to the designated cylinder, and

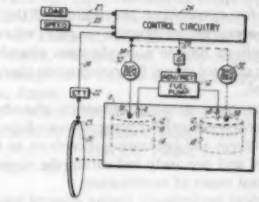
generating the sync pulse coincident with the occurrence of the offset signal next following the sensed ignition pulse.

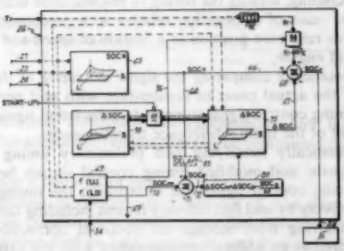
4,463,729

METHOD AND APPARATUS FOR CONTROLLING FUEL INJECTION TIMING IN A COMPRESSION IGNITION ENGINE

Robert H. Bullis, Avon, Conn.; Robert A. DiDomenico, Ludlow, Mass.; John A. Kimberley, East Granby; Thomas M. McHugh, Manchester, both of Conn.; Christopher A. Parent, West Springfield; James R. Voss, Wilbraham, both of Mass., and Walter J. Wiegand, Glastonbury, Conn., assignors to AMBAC Industries, Incorporated, Springfield, Mass.

Division of Ser. No. 532,293, Sep. 14, 1983, which is a continuation of Ser. No. 286,130, Jul. 23, 1981, abandoned. This application Nov. 14, 1983, Ser. No. 551,791
Int. Cl.³ F02M 51/00
U.S. Cl. 123—478 10 Claims





1. A fuel timing control system for a compression ignition engine comprising:

means for delivering fuel to the engine for combustion therein, said fuel delivery means being responsive at least to a timing control signal for controlling the timing of the delivery of fuel to a combustion chamber of the engine for combustion therein;

means for supplying a predetermined timing control signal representative of a desired timing of the onset of combustion in a said combustion chamber;

means responsive to a particular phenomenon which exhibits a relatively rapid level change coincident with and resulting from the onset of combustion in a said combustion chamber of the engine for providing a signal directly and precisely indicating the timing of the instant of actual onset of combustion in a said combustion chamber;

means for providing an engine timing signal representative of an engine reference position;

means for providing a signal indicative of engine speed;

said engine timing signal providing a common reference for both said desired onset of combustion signal and said actual onset of combustion signal;

said predetermined timing control signal supplying means being responsive to said speed signal to supply a said predetermined timing control signal as a function thereof;

means for comparing the signal indicative of the timing of the actual instant of the onset of combustion with said predetermined timing control signal to provide an error signal indicative of the timing difference therebetween;

means for automatically correcting said predetermined timing controlling signal, said corrected timing control signal being said timing control signal for controlling the timing of fuel delivery by said fuel delivery system to effect said desired timing of said onset of combustion, said means for correcting said predetermined timing control signal including retrievable storage means, means for forming at least one correcting signal and storing said correcting signal in said storage means, and means for combining said correcting signal with said predetermined timing control signal in a manner such that said corrected timing control signal tends to reduce said error signal, said means for forming a said correcting signal including means for adding a fraction less than unity of a said error signal to a correcting signal previously stored for the same speed condition such that said correcting signal represents substantially the most probable start of combustion timing under the same speed condition.

10. A method for controlling the timing of the onset of combustion in a compression ignition engine, whereby fuel delivery means deliver fuel to a combustion chamber in response to a timing control signal for combustion thereat, comprising the steps of:

sensing a phenomenon in said combustion chamber which results from and is directly representative of the onset of combustion therein and generating therefrom an electrical signal directly and precisely indicating the timing of the instant of actual onset of combustion;

supplying electrical preliminary timing control signals, said preliminary timing control signals being predetermined by mapping a representative said engine, said engine mapping including, sensing the timing of phenomenon indicative of the onset of combustion relative to a predetermined engine reference position as a funtion of speed and load for said engine;

automatically comparing the signal indicative of the timing of the actual onset of combustion with said preliminary timing control signal to provide a deviation signal indicative of the timing difference therebetween;

automatically modifying said preliminary timing control signals, said modified timing control signals being said timing control signals for controlling the timing of fuel delivery by said fuel delivery means, including the steps of retrieving from storage an electrical correction signal stored at an address corresponding with the existing engine speed and load conditions, said correction signal having been previously formed by the step of adding a fraction less than unity of a said deviation signal with a said correction signal then in storage at the address corresponding with the same speed and load conditions, and summing said retrieved correction signal with said preliminary timing control signal for providing said modified timing control signal in a manner which tends to reduce said deviation signal; and

wherein said steps of supplying a preliminary timing control signal, of comparing of said start of combustion signal and said preliminary timing control signal to provide a deviation signal, and of modifying said preliminary timing control signal each occur periodically at a rate determined by the engine cycling frequency.

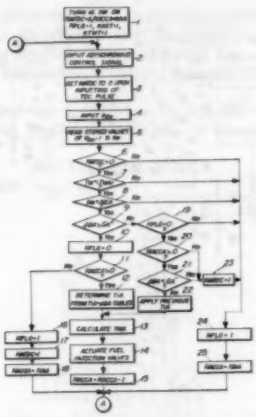
4,463,730

FUEL SUPPLY CONTROL METHOD FOR CONTROLLING FUEL INJECTION INTO AN INTERNAL COMBUSTION ENGINE IN STARTING CONDITION AND ACCELERATING CONDITION

Noriyuki Kishi, Tokyo, Japan, assignor to Honda Motor Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1983, Ser. No. 503,676
Claims priority, application Japan, Jun. 16, 1982, 57-103407
Int. Cl.³ F02D *5/00*
U.S. Cl. 123—491 **13 Claims**

1. A method for electronically controlling the supply of fuel being injected into an internal combustion engine having an ignition switch, through a fuel injection device, the method comprising the steps of: (1) monitoring generation of pulses of an engine position signal indicative of a predetermined crank angle of said engine; (2) determining whether or not said ignition switch of said engine is in a closed position; (3) detecting the value of at least one predetermined control parameter of said engine; (4) determining whether or not said detected value of said at least one predetermined control parameter shows a value indicative of a predetermined accelerating condition of said engine; (5) when it is determined in said step (4) that said detected value of said at least one predetermined control value



shows said value indicative of said predetermined accelerating condition of said engine, actuating said fuel injection device to inject fuel into said engine consecutively a predetermined number of times in synchronism with generation of pulses of a control signal having a predetermined constant pulse repetition period and generated independently of rotation of said engine, immediately after either generation of a pulse of said engine position signal or closing of said ignition switch has been detected; and (6) after completion of said consecutive fuel injections, suspending fuel injection until a subsequent pulse of said engine position signal is generated for the first time after the completion of said fuel injections.

4,463,731

DEVICE AND METHOD FOR CONTROLLING FUEL INJECTED INTERNAL COMBUSTION ENGINE PROVIDING COLD ACCELERATION EXTRA FUEL

Hiroki Matsuoka, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Apr. 27, 1982, Ser. No. 372,395
Claims priority, application Japan, Jun. 4, 1981, 56-86293
Int. Cl.³ F02B *3/00, 33/00*
U.S. Cl. 123—492 **8 Claims**

1. An engine control method for an internal combustion engine, said engine comprising:

an intake manifold and a fuel injection valve fitted to said intake manifold which is selectively opened and closed by the selective supply of an actuating signal thereto and which when so opened injects liquid fuel into said intake manifold, said internal combustion engine having an operational cycle;

said engine control method, comprising the repeatedly performed steps of:

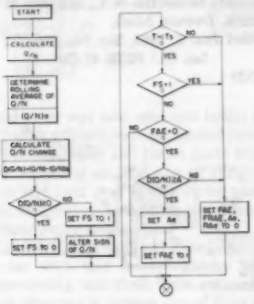
(a) sensing flow rate of air into said intake manifold with an intake air flow meter which measures the flow rate of air into said intake manifold and which outputs an intake air flow rate signal representative of said air flow rate;

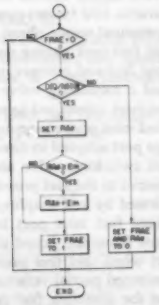
(b) sensing revolution of said internal combustion engine with an engine revolution sensor which responds to the revolution of said internal combustion engine and which outputs an engine revolution signal representative of said internal combustion engine revolution;

(c) sensing temperature of said internal combustion engine with an engine temperature sensor which responds to the temperature of said internal combustion engine and which outputs an engine temperature signal representative of the temperature of said internal combustion engine;

(d) determining at a sequence of instants separated by successive intervals successive instant values of a quantity approximately representing a proper amount of fuel to be injected through said fuel injection valve, said determination being based upon said intake air flow rate signal and said engine revolution signal;

(e) determining at said sequence of instants an average value of all said successive instant values of said quantity in a certain time interval up to the present;





(f) comparing at said sequence of instants the current value of said quantity with said average value and based thereupon determining whether or not said internal combustion engine is currently being accelerated;

(g) if it is determined from said engine temperature signal that said internal combustion engine is currently not yet fully warmed up to a predetermined temperature, and if, according to said comparison, it is so determined that said internal combustion engine is currently being accelerated beyond a first threshold rate, determining a first modification rate which is initially determined to be a first value according to said engine temperature signal and is then gradually reduced therefrom by a predetermined first decrement at each of said sequence of instants until it becomes less than zero, and further if, according to said comparison, it is so determined that said internal combustion engine is currently being accelerated beyond a second threshold rate, determining a second modification rate which is initially determined to be a second value according to said engine temperature signal and is then gradually reduced therefrom by a predetermined second decrement at each of said sequence of instants until it becomes less than zero; and,

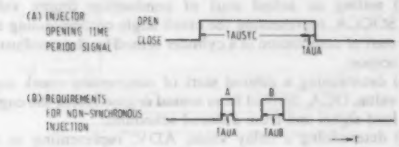
(h) modifying at said sequence of instants said quantity to be increased by the sum of said first and second modification rates to generate said actuating signal, each being of a duration corresponding to said quantity thus modified, said actuating signal being supplied to said fuel injection valve to cause it open for a period corresponding to said duration to pass therethrough fuel to be injected into said intake manifold.

4,463,732

ELECTRONIC CONTROLLED NON-SYNCHRONOUS FUEL INJECTING METHOD AND DEVICE FOR INTERNAL COMBUSTION ENGINES

Toshiaki Isobe, Nagoya, and Naoki Sugita, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 23, 1982, Ser. No. 391,431
Claims priority, application Japan, Mar. 2, 1982, 57-32843
Int. Cl.³ F02M *51/00*
U.S. Cl. 123—492 **7 Claims**



1. Electronic controlled non-synchronous fuel injecting method for an internal combustion engine comprising the steps of:

detecting a plurality of engine conditions;

determining, in response to a first set of said plurality of engine conditions, a synchronous fuel injection time for providing fuel to said engine in synchronism with the rotation of said engine;

detecting, in response to a second set of said plurality of engine conditions, whether a non-synchronous injection is indicated and generating a non-synchronous injection indication in response thereto;

determining a non-synchronous fuel injection time, in response to said non-synchronous injection indication, for providing fuel to said engine not in synchronism with the rotation of said engine;

determining whether a plurality of non-synchronous injection indications are generated during a single synchronous fuel injection;

increasing said synchronous fuel injection time by one of said non-synchronous fuel injection time when a single non-synchronous injection indication is generated during a single synchronous injection and said non-synchronous fuel injection time corresponding to only a single one of said non-synchronous injection indications when a plurality of non-synchronous injection indications are generated during a single synchronous injection; and

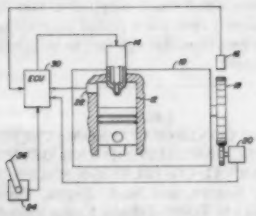
providing fuel to said engine in accordance with one of: (a) said synchronous fuel injection time when no non-synchronous injection indications are generated during said synchronous injection; (b) said non-synchronous fuel injection time when said non-synchronous injection indication is not generated during a synchronous injection; and (c) said increased synchronous fuel injection time when at least one non-synchronous injection indication is generated during said synchronous injection.

4,463,733

CLOSED LOOP FUEL INJECTION TIMING CONTROL

Edward S. Tsai, Hudson, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 15, 1983, Ser. No. 466,444
Int. Cl.³ F02M 39/00; F02D 1/04
U.S. Cl. 123—501 4 Claims



1. A method for controlling cylinder fuel injection timing of a fuel-injected diesel engine with a control system having an engine speed sensor, a combustion sensor, a crankshaft angle sensor and a load signal generator, the method comprising the steps of:

(a) setting an actual start of combustion timing value, SOCCA, representing the crank angle corresponding to a start of combustion in a cylinder sensed by the combustion sensor;

(b) determining a desired start of combustion crank angle value, DCA, derived from sensed engine speed, the engine load signal and from a stored schedule;

(c) determining a delay value, ADV, representing an expected time delay between application of a start injection signal to a fuel injector of the engine and start of combustion of the injected fuel;

(d) deriving a combustion timing error value, E, by subtracting SOCCA from DCA;

(e) setting a current accumulated error value, A(n), equal to the sum of a predetermined accumulated error value, A(n−1), plus the combustion timing error value, E, if the magnitude of E exceeds a predetermined threshold, Et;

(f) deriving an injection start timing value, SOLON, from the delay value ADV and the current accumulated error value A(n);

(g) starting fuel injection when the crank angle corresponds to SOLON;

(h) resetting the SOCCA value to the crank angle corresponding to the time that the combustion sensor senses combustion of the fuel injected, as a result of step (g); and

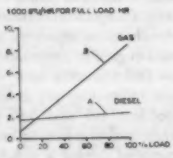
(i) repeating steps (b) through (h) for each operating cycle of the cylinder.

4,463,734

DUAL FUEL DIESEL ENGINE

Richard T. Akeroyd, 3803 - 67th St., Lubbock, Tex. 79403

Filed May 14, 1982, Ser. No. 378,100
Int. Cl.³ F02M 1/16, 21/00
U.S. Cl. 123—525 2 Claims



1. The method of converting the operation of an engine designed to use diesel oil fuel only to operate upon a mixture of liquid and gas fuels comprising the steps of:

a. providing an amount of liquid fuel and gas fuel,

b. injecting the liquid by injectors,

c. mixing the gas with air in an air intake,

d. providing small amounts of gas fuel, less than that of liquid fuel, at no load,

e. increasing the amount of gas fuel as the load increases in about direct relationship to the load,

f. also increasing the amount of liquid fuel furnished to the engine in about direct proportion to an increase in load, and

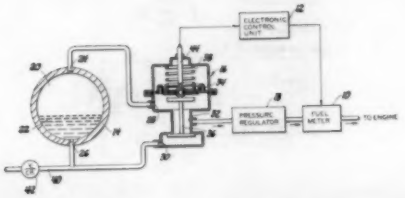
g. the increase of the gas fuel being about 14 times faster than the increase of the liquid fuel wherein the amount of gas fuel exceeds that of the liquid fuel at full load.

4,463,735

DUAL FUEL SUPPLY SYSTEM

Donald D. Stoltman, Henrietta, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 2, 1983, Ser. No. 500,372
Int. Cl.³ F02B 43/00
U.S. Cl. 123—525 1 Claim



1. A dual fuel supply system for an engine having a fuel metering apparatus, said system comprising a fuel tank adapted to contain a principal vapor phase fuel and a primarily liquid phase fuel, said fuel tank having an upper outlet for discharging vapor phase fuel and a lower outlet for discharging liquid phase fuel, and a switching valve assembly having a vapor phase fuel inlet port connected to said upper tank outlet and a liquid phase fuel inlet port connected to said lower tank outlet and a discharge port adapted to direct fuel to said fuel metering apparatus, said switching valve assembly also having a diaphragm responsive to the fuel pressure in said tank and a valve member positioned by said diaphragm for directing fuel from said vapor phase fuel inlet port to said discharge port and obstructing flow from said liquid phase fuel inlet port to said discharge port when said fuel pressure exceeds the pressure permitting a selected partial volume of vapor from said liquid phase fuel and for directing fuel from said liquid phase fuel inlet port to said discharge port and obstructing flow from said vapor phase fuel inlet port to said discharge port when said fuel pressure is less than the pressure permitting said selected partial volume of vapor from said liquid phase fuel.

4,463,736

CHAMBERED ROTARY METERING DEVICE

Wallace Hayward, Jr., 9630 Nelson, Kansas City, Kans. 66109

Filed Jun. 7, 1982, Ser. No. 385,701
Int. Cl.³ G01F 11/10, 11/00; F02M 21/00
U.S. Cl. 123—527 15 Claims

1. A chambered rotary metering device comprising:

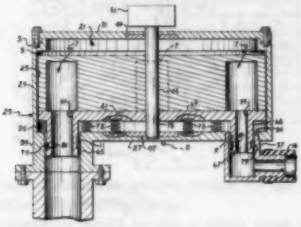
(a) a housing having an internal chamber therein with an inlet port and an outlet port leading thereinto;

(b) a rotor retained within said housing and adapted for rotational motion about an axis thereof, said rotor including at least one radially disposed and axially aligned chamber extending inwardly of a surface of said rotor, said surface being opposed to said inlet and outlet ports and

said chamber being non-concurrently alignable with said inlet and outlet ports upon rotation of said rotor;

(c) a motor means engaging said rotor and providing rotational impetus thereto for alternately biasing said chamber into fluid flow alignment with said inlet and outlet ports, said chamber adapted to be charged with a volumetric quantity of fluid when in fluid flow alignment with said inlet port and said chamber adapted to exhaust said volumetric quantity of fluid into said outlet port when biased into fluid flow alignment therewith;

(d) a seal plate non-rotatably retained in said housing between said rotor and said inlet and outlet ports, said seal plate including a first bore and a second bore therethrough aligned with said inlet and outlet ports respectively; said seal plate including no structure to allow direct flow of fluid from said inlet port to said outlet port through said seal plate; said seal plate including a surface sealably mating with said rotor surface; and



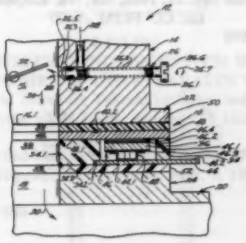
(e) biasing means to urge said seal plate into constant sealable engagement with said rotor whereby said chamber is sealed preventing said fluid from exhausting therefrom, when said chamber is rotated out of fluid flow alignment with either said inlet or said outlet port.

4,463,737

FUEL SYSTEM HAVING GASKET HEATER

Peter G. Berg, Attleboro Falls, Mass., and Stephen J. Strobel, Providence, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 26, 1983, Ser. No. 526,769
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—549 **2 Claims**



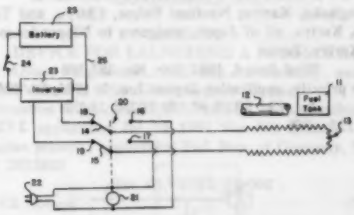
1. A fuel supply system for an internal combustion engine comprising throttle body means having passage means open at one end for communicating with a corresponding opening in an intake manifold of the engine to furnish an air-fuel mixture to the engine, the throttle body means having flange means disposed around the open end of the passage means and having nozzle means at a selected location relative to the throttle body flange means for furnishing a fluid to said passage means for forming an air-fuel mixture, and gasket means arranged between the throttle body flange means and mating flange means disposed on the engine around the opening in the intake manifold for sealing communication between the passage means and the engine, characterized in that the gasket means provides selected spacing between said flanges and provides compressible sealing means at respective opposite sides of the gasket means sealingly engage the throttle body flange means and the mating engine flange means, a chamber is provided in the gasket means at a location between portions of the throttle flange means and said engine flange means in a limited part of the gasket means at a selected location adjacent to said nozzle means, and electrical resistance heater means are accommodated in the chamber between portions of the throttle body flange means and said engine flange means to be energized therein for transferring heat to the throttle body flange means for preventing freeze-up of said nozzle means during furnishing of said fluid for forming said air-fuel mixture.

4,463,738

FUEL SYSTEM HEATING APPARATUS FOR DIESEL ENGINES

John R. Lee, 672 Fairway La., Frankfort, Ill. 60423, and Stephen W. Buckner, 318 Willow Rd., Homewood, Ill. 60430

Filed Sep. 29, 1982, Ser. No. 428,252
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—552 **3 Claims**



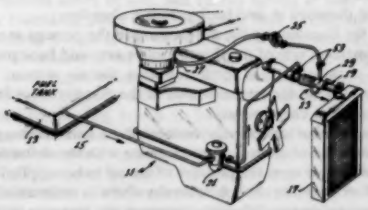
1. In a motor vehicle having a battery, an internal combustion engine, a fuel tank and fuel lines therebetween, the improvement comprising an electrical resistance heater positioned adjacent the fuel tank and/or fuel lines, inverter means carried by the vehicle connected to its battery for converting battery voltage to external power source voltage and frequency, relay means carried by the vehicle for connecting the resistance heater either to an external power source or to the inverter, and actuating means for the relay means connecting the resistance heater with the inverter only after the relay means are disconnected from the external power source.

4,463,739

FUEL PREHEATER WITH VAPOR LOCK PREVENTION MEANS

Norman C. Niblett, P.O. Box 590, Salisbury, Md. 21801

Filed Aug. 30, 1982, Ser. No. 413,137
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **5 Claims**



1. In a liquid-cooled engine having a radiator and an engine

block connected thereto by a coolant conduit forming a coolant path, and having a fuel line for conveying fuel from a fuel pump to said engine for combustion, the improvement comprising:

(a) a metallic coolant tube inserted in said coolant path between said radiator and said engine block so as to cause coolant to flow through said coolant tube; and

(b) a metallic fuel tube in said fuel line between said fuel pump and said engine;

(c) said fuel tube being disposed in a generally helical manner around the outside of said coolant tube and in direct contact therewith;

(d) an end convolution of said helical fuel tube being formed to and extending through said coolant tube in direct contact with the coolant therein; and

(e) a portion of said helical fuel tube intermediate said portion in direct contact with said coolant tube and said portion extending through said coolant tube being substantially sapced from and thereby not in contact with said coolant tube.

4,463,740

DEVICE FOR CONTROLLING ATOMIZATION OF FUEL IN INTERNAL COMBUSTION ENGINE

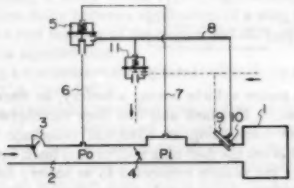
Yasuo Sagisaka, Kariya; Naofumi Fukue, Chiryu, and Toshio Kondo, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 4, 1982, Ser. No. 385,266

Claims priority, application Japan, Jun. 9, 1981, 56/88450

Int. Cl.³ F02B *47/08*; F02M *23/08*

U.S. Cl. 123—568 **2 Claims**



1. An apparatus for controlling atomization of fuel in an internal combustion engine having a main air intake passage and a throttle valve therein, comprising:

an air regulator adapted to control the pressure of air injected to be mixed with fuel in an electronically controlled fuel injection device such that the pressure of the injected air is higher than the pressure in the main air passage by a predetermined pressure, said air regulator including:

a housing;

a diaphragm disposed in said housing and cooperating with said housing in defining a back pressure chamber at one side thereof and a control chamber at the other side thereof;

a spring disposed in said back pressure chamber;

means for transmitting the air pressure in the passage at the downstream side of the throttle valve into said back pressure chamber; means for introducing the air pressure in the passage at the upstream side of the throttle valve into said control chamber; and

a valve member operatively connected to said diaphragm and adapted to control, in accordance with the deflection of said diaphragm, the pressure of the air to be supplied to the fuel injection device, whereby there is maintained a constant pressure differential between the pressure at the downstream side of the throttle valve and the pressure in said control chamber thereby to obtain a uniform particle size of the atomized fuel.

4,463,741

ELECTRONICALLY CONTROLLED EXHAUST GAS RECIRCULATION APPARATUS

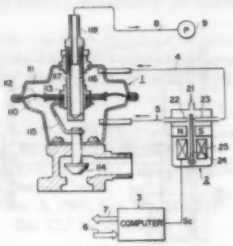
Kazuo Shinoda, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 28, 1982, Ser. No. 425,261

Claims priority, application Japan, Oct. 30, 1981, 56-174229; Dec. 22, 1981, 56-207387

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—571 **10 Claims**



1. An electronically controlled EGR apparatus for controlling an EGR quantity through an EGR valve having a valve aperture, the degree of opening of which varies in response to movement of a diaphragm, the electronically controlled EGR apparatus comprising:

an electronic circuit for producing a control signal having a predetermined duty ratio;

a valve for regulating the flow of fluid between a first source of fluid and a pair of vacuum chambers of said EGR valve sectioned by said diaphragm, said control valve regulating the flow of fluid by a mechanism driven by said control signal from said electronic circuit; and

a slit mechanism for changing a degree of communication between said pair of vacuum chambers and a second source of fluid in response to the movement of said diaphragm.

4,463,742

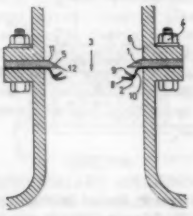
FUEL ENCONOMIZER

Cyril J. Williams, 23 Borrow St., Freeling, Australia 5372

Filed Sep. 21, 1982, Ser. No. 420,905

Int. Cl.³ F02M *29/00*

U.S. Cl. 123—590 **13 Claims**



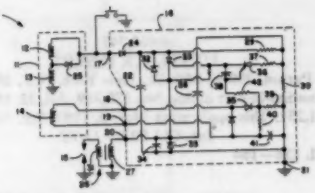
1. A fuel economiser adapted to be inserted in the induction system of an internal combustion engine downstream of the carburetor thereof, said induction system including an induction passage for flow of an air stream through the system, said economiser comprising a plate including an aperture having a diameter less than the diameter of the induction passage, and a disc adjacent to and downstream of said plate and having a plurality of teeth protruding into the induction passage and air stream adjacent said plate.

4,463,743

CAPACITOR DISCHARGE IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Arthur O. Fitzner, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 14, 1981, Ser. No. 330,420
Int. Cl.³ F02P 3/08
U.S. Cl. 123—599 7 Claims



1. A capacitor discharge ignition system for use in an internal combustion engine comprising:

(A) a connection means having a stator input terminal, a trigger input terminal, a ground terminal, and an output terminal;

(B) a main capacitor connected between said stator input terminal and said ground terminal to be charged in response to a first specific polarity signal;

(C) a main gated switch connected between said capacitor and said output terminal to controllably discharge said capacitor into a load connected between said output terminal and ground, said main gated switch having an anode connected to said capacitor, a cathode connected to said output terminal, and a gate;

(D) a pilot gated switch having a cathode connected to the gate of said main gated switch, a gate connected to said trigger input terminal to receive a trigger signal, and an anode; and

(E) a power supply connected between the cathode of said main gated switch and the anode of said pilot gated switch to raise the voltage of said power supply as said main gated switch discharges said main capacitor and maintain the voltage of said power supply above the voltage of the cathode of said main gated switch;

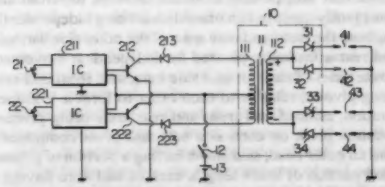
whereby gate current is supplied to said gate of said main gated switch as said main gated switch is turning on.

4,463,744

DISTRIBUTORLESS IGNITION SYSTEM WITH SURGE ABSORBING MEANS AND APPARATUS THEREFOR

Minoru Tanaka, Takahagi; Takeshi Ishizuka, and Kenzo Shima, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 6, 1981, Ser. No. 241,374
Claims priority, application Japan, Mar. 7, 1980, 55-27914
Int. Cl.³ F02P 1/00
U.S. Cl. 123—643 3 Claims



1. A distributorless ignition system comprising:

(a) an ignition coil including a primary winding and a secondary winding;

(b) power source means connected to the primary winding of said ignition coil for supplying to said primary winding a primary current alternately flowing in a first direction thereby inducing across said secondary winding a secondary voltage alternately changing between a first polarity and a second polarity; and

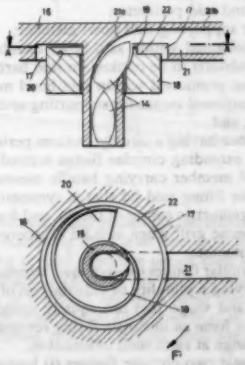
(c) a plurality of rectifying means, each having surge absorbing means associated therewith, and a plurality of spark gap means connected to the secondary winding of said ignition coil so as to constitute at least two closed circuits with said rectifying means, said rectifying means in the closed circuits being arranged in such a relation that one of them is forward directed while the other is reverse directed when the secondary voltage of the first polarity is induced in said secondary winding, whereby a spark gap jumps across the spark gap means connected in one of said closed circuits with said rectifying means which is forward directed with respect to the secondary voltage of the first polarity induced in said secondary winding, each of said rectifying means having surge absorbing means associated therewith being a diode exhibiting a constant voltage characteristic in its reverse direction without failure of the diode.

4,463,745

DEVICE FOR LAUNCHING A PROJECTILE

Josef Acker, Seligenstadt, Fed. Rep. of Germany, assignor to Jacob Acker & Sohne, Fed. Rep. of Germany

Continuation of Ser. No. 23,903, Mar. 26, 1979, abandoned. This application Jul. 10, 1981, Ser. No. 282,060
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1978, 2813840
Int. Cl.³ F41B 15/00
U.S. Cl. 124—6 17 Claims



1. Apparatus for ejecting bodies comprising a carrier driven in rotation about an axis, said carrier having at least one radially extending guide tube, said guide tube having an inlet for receiving bodies to be thrown located approximately at the axis of rotation of the carrier and an outlet at the periphery of the carrier, guide means secured to said carrier for guiding a body in said guide tube as said carrier undergoes rotation, means for feeding bodies to be thrown to said inlet axially along the axis of rotation of said carrier, and a stationary spiral member surrounding the feeding means and cooperating with said guide means for confining the bodies to travel along said spiral member while being carried along in rotation with said carrier via said guide means, said spiral member having an inner inlet end which engages a body supplied by the feeding means to said guide tube and an outer outlet end beyond which the body is free to travel in said guide tube, said guide means

having an open end which passes said outlet end of said spiral member as the carrier undergoes rotation such that when the body passes said outlet end of the spiral member the body is free to travel in said guide tube beyond the open end of said guide means and to undergo radial acceleration in said guide tube, said guide means and guide tube being radially aligned so that the body travels radially in said guide tube from said inlet to said outlet while being guided in the radial travel, said guide tube being of a length beyond the guide means to enable the body to undergo radial acceleration in said guide tube and reach muzzle velocity at said outlet of said guide tube which exceeds the circumferential velocity thereat.

4,463,746

PORTABLE BARBECUE GRILL

Henry A. Knuth, and Virgil W. Daily, III, both of Paris, Ill., assignors to UNR Industries, Inc., Chicago, Ill.

Filed Aug. 18, 1982, Ser. No. 409,035
Int. Cl.³ F24B *7/04*; A47J *37/00*
U.S. Cl. 126—25 R **13 Claims**

1. A portable barbecue grill which comprises:

(a) a bowl member having a circular upper perimeter and having an outwardly and upwardly extending circular flange around said perimeter;

(b) means for supporting said bowl member;

(c) means positioned within said bowl member for use in heating foodstuffs to be cooked on said barbecue grill;

(d) grill means positioned within said bowl member above said last mentioned means for supporting said foodstuffs to be cooked; and

(e) a lid member having a circular bottom perimeter, and an outwardly extending circular flange around said perimeter, said lid member carrying handle means providing a purchase for lifting said lid that is symmetrically placed above the geometric center of the lid, and for carrying the entire barbecue grill when said lid is secured in place on said bowl member,

one of said circular flanges on said bowl member and said lid member having a plurality of indentations of substantially equal size and shape that are equally spaced around its perimeter to form an inwardly facing reentrant portion of said one flange at each such indentation,

the other of said two circular flanges (i) having a diameter smaller than the inner diameter of said one, indentation-bearing flange, and substantially larger than twice the distance between the geometric center of said one flange and any of its said inwardly facing reentrant portions, and (ii) having at least one gap in its said perimeter, each of said gaps being of a size and shape to accept one of said reentrant flange portions, and all said gaps, when a plurality of gaps is present, being equally spaced around said other flange with the same spacing as the spacing of said reentrant flange portions,

said lid member fitting loosely, both horizontally and vertically, within said bowl member flange when said lid is secured to said bowl,

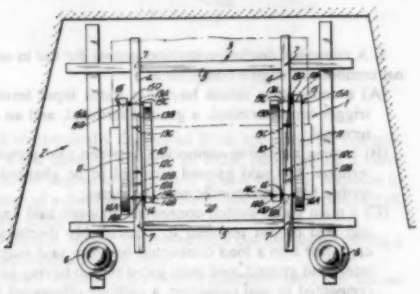
to provide a secure attachment of said bowl and lid when each of said gaps has one of said reentrant flange portions seated therein and all the other of said reentrant flange portions overlie said other circular flange, and the lid is thereafter turned a short angular distance so that solid portions of said other circular flange nest under all said inwardly facing reentrant portions of said one circular flange, and at the same time provide communication, around the perimeter of said lid member, between the exterior space around the barbecue grill and the interior of the grill.

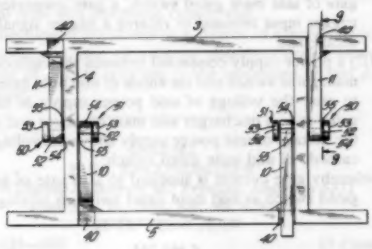
4,463,747

FIREPLACE INSERT

James Parton, 300 E. 56th St., New York, N.Y. 10022

Continuation-in-part of Ser. No. 285,769, Jul. 22, 1981, Pat. No. 4,411,251. This application Mar. 8, 1982, Ser. No. 356,238
Int. Cl.³ F23H *13/02*
U.S. Cl. 126—164 **5 Claims**





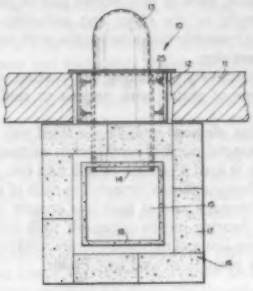
1. A metal fireplace insert comprising a frame, a plurality of arms pivotly mounted on said frame, each of said arms being pivoted for independent movement relative to each other and to the frame to form a plurality of log-receiving spaces, said frame comprises a pair of side bars and front and rear bars mounted to said side bars, said side bars being located adjacent the opposite edges of the front and rear bars, said arms being pivotly mounted on said side bars, each of said side bars having a front and rear arm pivotly mounted thereon, the front and rear arms pivotly mounted on one side bar being independently movable from the front and rear arms of the other side bar, said front and rear arms being pivoted for independent movement on opposite sides of each of said side bars, said front and rear arms being pivoted relative to each other to form a V-shaped configuration, each of said front and rear arms being pivoted on a common pivot on each side bar, said pivot comprises a shank and an outer head, said shank having a portion of greater length and portion of lesser length, each of said arms having a pivot opening and a removal channel communicating therewith, the width of said removal channel being less than the shank portion of greater length and greater than the shank portion of lesser length.

4,463,748

INSULATING APPARATUS FOR A FLUE THIMBLE

Donald W. Sinkes, R.R. 6, Box 291, North Vernon, Ind. 47265

Filed Apr. 14, 1983, Ser. No. 484,902
Int. Cl.³ F23J 13/00
U.S. Cl. 126—314 5 Claims



1. An insulating apparatus for mounting within an opening in a wall or the like and for receiving a flue thimble extending through the opening, said apparatus providing for reception of a vent pipe within the flue thimble and for insulation of the adjacent wall against the heat of the vent pipe and flue thimble, said apparatus comprising:

a double-walled, cylindrical body member having inner and outer cylindrical walls defining an annular. insulating chamber therebetween, the inner diameter of the inner cylindrical wall being greater than the outer diameter of the flue thimble to enable the flue thimble to be received inside of the inner cylindrical wall, the outer diameter of the outer cylindrical wall being less than the size of the opening in the wall to enable the cylindrical body member to be received within the wall opening, said cylindrical body member including a front wall extending between first ends of the inner and outer cylindrical walls and a rear wall extending between the opposite ends of the inner and outer cylindrical walls, the front wall including several apertures providing communication to the annular, insulating chamber from exterior of said cylindrical body member, the rear wall being solid and thereby preventing communication therethrough to the annular, insulating chamber;

a perimetric flange extending outwardly from the front end of the outer cylindrical wall, said flange being sized and configured to cover that portion of the wall opening outward of the outer cylindrical wall;

first mounting means for mounting said cylindrical body member to the flue thimble to have the inner cylindrical wall spaced apart from the outer surface of the flue thimble;

second mounting means for mounting said cylindrical body member to the wall within the opening in the wall to have the outer cylindrical wall spaced apart from the wall, thereby providing an insulation of the wall against heat within the flue thimble by three separate insulating spaces including a first space between the wall and the outer cylindrical wall, a second space between the outer and inner cylindrical walls, and a third space between the inner cylindrical wall and the flue thimble;

a cover plate having an inner diameter sized less than the inner diameter of the inner cylindrical wall of said cylindrical body member, the inner diameter of said cover plate being sized to closely receive a vent pipe extending therethrough, said cover plate having an outer perimeter sized and configured to cover said perimetric flange;

aperture means for providing communication between the annular, insulating chamber of said cylindrical body member and the exterior of said cylindrical body member; and

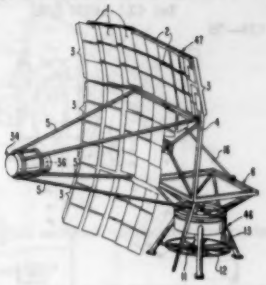
third mounting means for mounting said cover plate adjacent said perimetric flange.

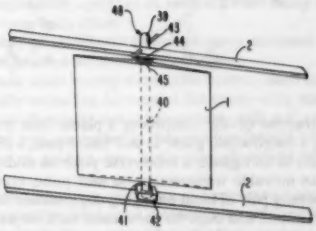
4,463,749

MODULAR SOLAR CONCENTRATOR

Isidore F. Sobczak; William C. Cleveland, Jr., both of Santa Ana, and Robert L. Pons, Mission Viejo, all of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Mar. 8, 1982, Ser. No. 355,438
Int. Cl.³ G02B 5/10
U.S. Cl. 126—451 8 Claims





1. A point focusing solar radiation concentrator comprising:

a reflector consisting of at least one module, each module comprising several reflective panels each having uniform size and shape, each panel having a surface area which is a portion of a sphere, and each panel being substantially equidistant from a small focal aperture; and

a solar radiation receiver fixedly positioned at said focal aperture;

wherein the distance between said focal aperture and each panel is substantially equal to one half of the radius of curvature of said panel;

said panels are individually pointed to reflect solar radiation onto said focal aperture; and

each module comprises at least two identical piecewise-straight parallel beams, wherein each panel is mounted between first and second beams within a single module;

an elongated axle, orthogonal to each of the first and second beams and having first and second ends, is associated with each panel, said axle coupling the panel to the first and second beams;

each axle is mounted substantially flush onto a back surface of its associated panel so that the panel pivots about a first axis substantially coincident with the long axis of the axle;

associated with each panel is means for firmly holding said panel in a desired angular position about said first axis; and

further associated with each panel at the intersection of the first beam and the first end of the associated axle, and substantially orthogonal to each of the first beam and the axle, is an elongated mounting member;

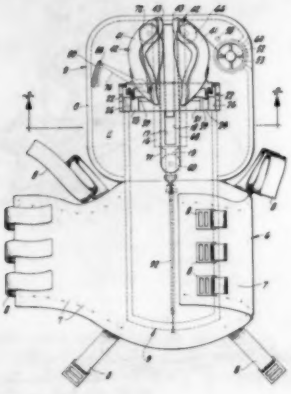
whereby the axle is variably mounted transversely along said elongated mounting member, thus allowing the panel to partially pivot about a second axis orthogonal to the first axis.

4,463,750

TRACTION DEVICE

Anthony G. Borschneck, 15603 Prospect Dr., Redding, Calif. 96001

Filed Jan. 26, 1983, Ser. No. 461,085
Int. Cl.³ A61H *1/02*
U.S. Cl. 128—75 **10 Claims**



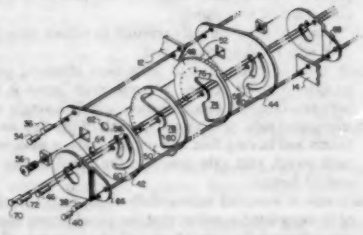
1. A traction device comprising a planar base frame, means defining a longitudinal guide in said base frame, a slide adapted to operate in said guide, a transverse yoke on said slide, a pair of blocks movable transversely on said yoke, connectors on said blocks, a pair of head-engaging cups, means for articulating each one of said cups for movement on a respective one of said connectors in a direction longitudinally inclined with respect to said planar base frame, and tension means for moving said cups in a predetermined longitudinal direction relative to said planar base frame.

4,463,751

STABILIZING KNEE HINGE

Gary R. Bledsoe, 2001 Kent Dr., Arlington, Tex. 76010

Filed Dec. 27, 1982, Ser. No. 453,716
Int. Cl.³ A61F *3/00*
U.S. Cl. 128—80 C **10 Claims**



1. A knee stabilizing hinge for simulating the motion of the human knee and for restricting the range of motion thereof, said hinge comprising:

a first joint element including a first pair of plates secured in spaced parallel relationship including at least one arcuate cam slot formed through said first pair of plates;

a second pair of plates rotatably mounted between said first pair of plates, each of said second pair of plates rotatable independently of the other and including a stop limit selectively rotatable into intersection with said at least one arcuate cam slot;

means for selectively restricting the rotation of both of said second pair of plates with respect to said first pair of plates;

a second joint element including a third pair of plates secured in spaced parallel relationship enclosing and rotatable about at least a portion of said first pair of plates; and

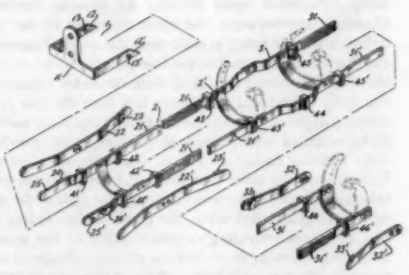
a pivot and bearing means mounted to each of said third pair of plates through said at least one arcuate cam slot, said pivot and bearing means engagable with said at least one arcuate cam slot and movable therein to the extent permitted by the position of said stop limits.

4,463,752

LIMB-SUPPORTING FRAME WHICH IS MOVABLE AND EASY TO BE DISMANTLED

Kuo M. Liao, 4th Fl., 7, Lane 85, Kuang Fu North Rd., Taipei, Taiwan

Filed Oct. 29, 1982, Ser. No. 437,626
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—87 R **1 Claim**



1. A limb-supporting frame which is movable and easy to be dismantled, mainly comprising an ankle-supporting frame, a shank-supporting frame, a leg-supporting frame, and eleven collars, charaterized by the two ends of said ankle-supporting frame being provided with two arms on which there are two holes used for coupling with the blocks and the protuberances of the said shank-supporting frame, said arms being fixed to the collars, said ankle-supporting frame being able to be swung backward when the collars are loosened; said shank-supporting frame being divided into a lower shank-supporting frame and an upper shank-supporting frame, the lower part of said upper shank-supporting frame being provided with threads which are especially used for engaging with the threads provided on the lower parts of said lower shank-supporting frame in order that the shank-supporting frame can be extended or contracted, a joint being formed between the upper shank-supporting frame and the lower leg-supporting frame by means of the collar of the lower leg-supporting frame being adapted to the other arm of the upper shank-supporting frame, the threads provided on the upper part of said lower shank-supporting frame being engaged with the threads provided on the lower part of said upper shank-supporting frame, the lower part of said lower shank-supporting frame being joined to said ankle-supporting frame, a set of elastic packing pieces is mounted to the sides opposite to the threads of the lower shank-supporting frame and the threads of the upper shank-supporting frame, two ends of said elastic packing piece being bent outward and one ends

of said elastic packing piece being provided with a rubber protuberance; said leg-supporting frame being provided with an upper leg-supporting frame and a lower leg-supporting frame, the lower part of said upper leg-supporting frame and the upper part of said lower leg-supporting frame being provided with threads, the threads of said upper leg-supporting frame being especially designed for engaging with the threads of said lower leg-supporting frame, said upper leg-supporting frame and said lower leg-supporting frame being fixed together by the collars, a joint being formed between said lower leg-supporting frame and said upper shank-supporting frame, and at the side opposite to the threads of said lower leg-supporting frame being mounted a packing piece which is bent at one end and has a rubber protuberance at one end; said collars being divided into two groups, one group of the collars being especially used for loosening said ankle-supporting frame so as to enable the joint of said ankle-supporting frame and said shank-supporting frame to swing backward or used for fixing said ankle-supporting frame and said shank-supporting frame vertically, the second group of the collars of which four collars are used for pressing the packing pieces to the side opposite to the threads of said lower leg-supporting frame and of which the other four collars are used for fixing the threads of said lower leg-supporting frame and the threads of said upper leg-supporting frame and said packing pieces together.

4,463,753

COMPRESSION BONE SCREW

Ramon B. Gustilo, 701 Park Ave., Minneapolis, Minn. 55415

Continuation-in-part of Ser. No. 109,639, Jan. 4, 1980, abandoned. This application Sep. 11, 1981, Ser. No. 301,415

Int. Cl.³ A61F *5/04*

U.S. Cl. 128—92 B **13 Claims**

1. A compression bone screw comprising:

(a) a distal portion including a distal shaft having a plurality of distal threads therein, the distal threads having a given pitch, said distal portion terminating in a substantially pointed end;

(b) a proximal portion including a proximal shaft having a diameter which is greater than the diameter of the distal shaft said proximal portion including a tool interengaging means thereon; and

(c) an intermediate portion connecting the proximal portion and the distal portion, the intermediate portion including a tapered shaft having a threadless substantially annular smooth outer surface, wherein the tapered shaft and the distal threads cooperate so as to create opposing forces which effect compression of bone tissue between the intermediate portion and the distal portion when the distal threads and the tapered shaft are both engaging bone tissue.

4,463,754

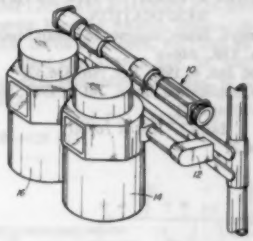
SAFETY CONTROL AND LOCK FOR ANESTHETIC VAPORIZERS

Sandy McDonald, Ancaster, Canada, assignor to Southmedic Incorporated, Ancaster, Canada

Filed Aug. 11, 1983, Ser. No. 522,397

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—200.14 **4 Claims**



1. A safety control and lock for anesthetic vaporizers comprising:

a supporting bracket;

a rod rotatably mounted in the supporting bracket;

a plurality of C-collars, each C-collar mounted around and longitudinally spaced on said rod such as to be rotatable therewith, each C-collar having a longitudinal opening the longitudinal openings of each C-collar being radially offset from each other;

an assembly of anesthetic vaporizer tanks mounted on said support bracket adjacent each C-collar;

each of said tanks having a rotatable control knob including a radially extending horizontal flat spiral wing conjointly rotatable therewith into engagement with a C-collar on said rod and receivable in the opening thereof when said opening is rotated into horizontal alignment with said wing;

said C-collar engaging said wing and preventing rotation of said control knob when said opening in said C-collar is not in horizontal alignment with said wing.

4,463,755

BREATHING CIRCUIT

Tatsuo Suzuki, Yokohama, Japan, assignor to Terumo Corporation, Tokyo, Japan

Filed May 13, 1982, Ser. No. 377,602

Claims priority, application Japan, May 18, 1981, 56-74759; May 20, 1981, 56-74992; May 20, 1981, 56-76310; Dec. 9, 1981, 56-197874

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—204.18 **26 Claims**

1. A breathing circuit which comprises:

coupling means adapted to be coupled to a patient and through which the patient can inhale and exhale;

a source of supply fluid for the patient;

a coaxial tube type main tube coupled between said coupling means and said supply source, and comprising an inner flexible tube constituting an inhalant circuit and a corru-

gated outer tube having a larger average wall thickness than said inner tube, said outer tube encircling the periphery of said inner tube and defining an exhalant circuit in conjunction with said inner tube; and

an inner tube retaining member disposed at least at one end of said coaxial tube type main tube for keeping said inner tube and said outer tube at a prescribed distance from each other;

the average wall thickness of said inner tube being 20 to 60% of the average wall thickness of said outer tube.

4,463,756

VENTILATION APPARATUS FOR ARTIFICIAL RESPIRATION

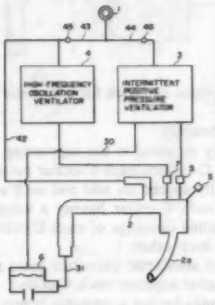
Tran N. Thuc, Omiya, Japan, assignor to Senko Medical Instrument Mfg., Co., Ltd., Japan

Filed Jan. 4, 1982, Ser. No. 336,629

Claims priority, application Japan, Jul. 3, 1981, 56-99180[U]; Jul. 23, 1981, 56-109462[U]

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—204.21 **12 Claims**



1. A ventilation apparatus for artificial respiration which comprises:

(a) a gas source for supplying respiratory gas under pressure;

(b) a patient circuit for supplying the respiratory gas to a patient;

(c) a high frequency oscillation ventilator composed of a pneumatic circuit, said high frequency oscillation ventilator being connected to said gas source via a feed tube and also to said patient circuit via a feed tube so that said high frequency oscillation ventilator feeds the respiratory gas to said patient circuit at a preselected high frequency;

(d) an intermittent positive pressure ventilator composed of a pneumatic circuit, said intermittent positive pressure ventilator being connected to said gas source via a feed tube and also to said patient circuit so that said intermittent positive pressure ventilator intermittently feed the respiratory gas to said patient circuit at a preselected frequency; and

(e) shut-off valve means for selectively communicating said gas source with said high frequency oscillation ventilator and said intermittent positive pressure ventilator for operating said two ventilators either alone or in combination.

4,463,757

COVERING DEVICE FOR TRACHEOSTOMY STOMA

Edward J. Schmidt, 774 LaFond Ave., St. Paul, Minn. 55104

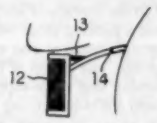
Filed May 3, 1982, Ser. No. 374,486

Int. Cl.³ A62B *7/10*

U.S. Cl. 128—205.29 **20 Claims**

1. A flexible air filtering and conditioning device for covering a tracheostomy stoma and for securement about the lower anterior neck of a wearer, comprising:

a. a washable encasement member having parallel, coextensive front and back panels having peripheral, structural portions and having flexible, air permeable mesh portions extending therebetween for permitting the passage of air therethrough, said peripheral structural portions of each said front and back panel including opposing upper side border portions, said encasement member further having openable and closable access means thereinto comprised of Velcro fasteners facingly and matingly secured to at least a segment of said peripheral structural portions of said front and back panel,



b. flexible and washable strap means for securing said device about the neck of a user, said strap means extending from generally said upper opposing side portions of one said panel members and being fastened thereto, said strap means further having adjustable fastener means at the ends thereof, and,

c. air filter means for placement within said encasement member for filtering the air passing therethrough.

4,463,758

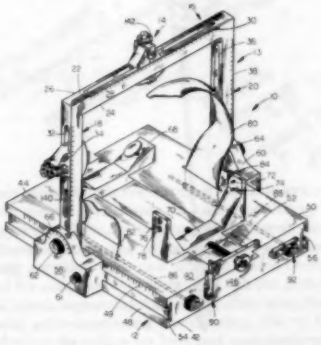
COMPUTED TOMOGRAPHY STEREOTACTIC FRAME

Arun A. Patil, 1011 Valley View Dr., Minot, N. Dak. 58701, and E. Amundson, Minot, N. Dak., assignors to Arun A. Patil, Minot, N. Dak.

Filed Sep. 18, 1981, Ser. No. 303,408

Int. Cl.³ A61B *19/00, 17/00*

U.S. Cl. 128—303 B **8 Claims**



1. A computed tomography oriented stereotactic frame, comprising,

a substantially flat, horizontally disposed support means for supporting a patient's head thereon, said support means comprising a plate including top and bottom portions, opposite sides, and opposite ends,

said top portion being adapted to support the backside of a patient's head, a support member selectively longitudinally slidably mounted at each of the sides of said support means,

a frame means comprising first and second leg portions selectively pivotally secured to said support members and extending upwardly therefrom, and a base portion extending between the upper ends of said leg portions,

said leg portions and said base portion having outer edge portions which are visible on a scanning apparatus, a head

support member and neck support member mounted on said support means, a flexible strap means mounted on said support means for securing a patient's head to the support means,

and a probe holder means selectively movably mounted on said frame means positioned within the plane of the frame means.

4,463,759

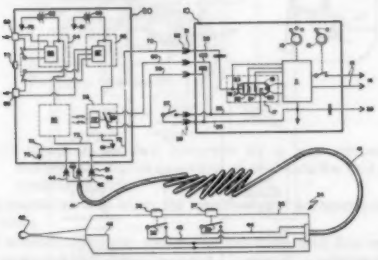
UNIVERSAL FINGER/FOOT SWITCH ADAPTOR FOR TUBE-TYPE ELECTROSURGICAL INSTRUMENT

Jon C. Garito, 22 Deering La., East Rockaway, N.Y. 11558; Alan Ellman, 1 Auerbach La., Lawrence, N.Y. 11516, and Zvi Rozensher, 1135 Railroad Ave., Hewlett, N.Y. 11557

Filed Jan. 13, 1982, Ser. No. 339,171

Int. Cl.³ A61B *17/39*

U.S. Cl. 128—303.14 **13 Claims**



1. A self-powered control unit for interfacing a finger switch handpiece probe having a cable terminated by a handpiece connector to a mainframe electrosurgical instrument having an RF generator employing a filament-heated electron tube RF oscillator circuit activated by a DC voltage derived from an AC line voltage operated power supply and having a mainframe connector for receiving a control unit connector, said mainframe instrument further having an ON-OFF switch for switching on the power supply and for supplying electric current to the tube filament to heat same to place the mainframe instrument in a standby mode, said mainframe instrument further having a foot switch connected to the mainframe instrument and electrically connected to the RF oscillator circuit in such manner that when the foot switch is activated the RF oscillator is switched on generating RF electrosurgical currents thereby placing the mainframe instrument in its operating mode; said control unit comprising a first connector for receiving the handpiece connector and a second connector for connecting said control unit to the mainframe connector, said control unit further having a first circuit connected to the first connector and comprising a light-emitting device connected in series with the handpiece probe finger switch when the handpiece probe and control unit are connected whereby operation of the finger switch causes the light-emitting device when powered to emit light, said control unit further having a second circuit connected to the second connector and comprising a light-sensitive active device located to receive light emitted by the light-emitting device and upon so receiving such light being converted from a normally OFF condition to an active ON condition whereby said handpiece probe is electrically isolated from the mainframe instrument AC line voltage, means connected to the first and second circuits for powering same; characterized by said control unit comprising:

(a) means in said second circuit for connecting said active device to the second connector in such manner that when the control unit is connected to the mainframe instrument, the active device is coupled in parallel with the foot switch whereby the mainframe instrument can be switched into its operating mode by actuating either the finger switch or the foot switch,

(b) means for electrically isolating the control unit first connector from its second connector to prevent harmful power feedback of AC line voltage or DC voltage from the mainframe instrument to the handpiece probe via the control unit when connected together,

(c) said powering means comprising a first battery connected in the first circuit and a second battery connected in the second circuit, and

(d) battery monitoring circuits coupled to the first and second circuits and including a battery condition indicator operable to indicate battery deterioration below a threshold voltage indicating battery replacement is needed.

4,463,760

IMPLANTABLE HEART PACEMAKER

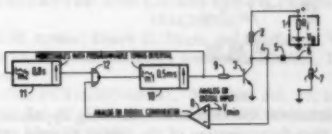
Hakan Elmqvist, Bromma, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 3, 1982, Ser. No. 404,713

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1981, 3130872

Int. Cl.³ A61N *1/36*

U.S. Cl. 128—419 PG **4 Claims**



1. An implantable heart pacemaker comprising a battery whose internal resistance depends on the charge condition of the battery, as well as comprising a stimulus pulse generator connected to the battery having an output capacitor which is respectively slowly charged and subsequently rapidly discharged in order to generate a stimulation pulse, control means comprising a control circuit connected with said stimulus pulse generator for triggering said stimulus pulse generator, said control means further comprising comparator means having an input coupled with said output capacitor for comparing a voltage at said output capacitor with a specific minimum voltage (V_{min}) and having an output coupled with said control circuit such that the discharge of the output capacitor to produce selected stimulation pulses is only triggered upon the attainment of the specific minimum voltage (V_{min}) at the output capacitor.

4,463,761

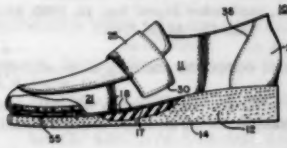
ORTHOPEDIC SHOE

Sidney Pols, c/o E. J. Sabel Co., Benson East Building, P.O. Box 644, Jenkintown, Pa. 19046, and Eugene L. Schultz, 100 DeVille Clr., Williamsville, N.Y. 14221

Filed Aug. 2, 1982, Ser. No. 404,607

Int. Cl.³ A61F *5/14*

U.S. Cl. 128—581 **9 Claims**



1. An orthopedic shoe capable of being fitted and molded on and to the foot of a wearer which comprises

an upper of multi-piece construction comprising

an outer layer having an inner lining bonded thereto,

said upper being designed to extend over the foot of the wearer, and capable of being softened by heat to be moldable to at least one deformity of the foot of the wearer, and

a sole having a flat bottom surface and which is joined to the upper.

4,463,762

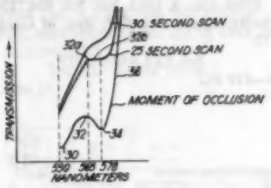
APPARATUS FOR OBTAINING AN OBJECTIVE DETERMINATION OF THE RATE OF OXYGEN UTILIZATION IN PERIPHERAL TISSUE

Harry E. Rubens, Bay Harbor Islands, Fla., assignor to Institute of Applied Biology Special Cancer Research Project, Bay Harbor Islands, Fla.

Continuation-in-part of Ser. No. 843,270, Oct. 18, 1977, Pat. No. 4,222,389. This application Mar. 24, 1980, Ser. No. 132,994

Int. Cl.³ A61B 5/00

U.S. Cl. 128—633 10 Claims



1. A non-invasive, spectrometric measuring apparatus for objective in vivo determination of the rate of oxygen utilization in peripheral tissue, comprising:

tissue encircling clamping means for isolating a segment of blood in the tissue of the skin to thereby produce a state of occlusion whereby oxygen absorption may be analyzed,

means for detecting coefficients of absorption for oxyhemoglobin in said tissue in at least first and second wavelength regions after occlusion and during a time interval, said first and second wavelength regions having different rates of change of absorption coefficient when said tissue is in an occluded state, said means for detecting providing electrical output values indicative of the absorption coefficient in said first and second wavelength regions during the time interval, and

means coupled to the output of said detection means for determining the rate of change of said absorption coefficient in said first wavelength region relative to the rate of change of said absorption coefficient in said second wavelength region and for producing an output therefrom which is indicative of the rate of oxygen utilization in said tissue.

4,463,763

ULTRASONIC COMPOUND SCANNING DIAGNOSTIC APPARATUS

Akira Koyano, and Seiichiro Mizuno, both of Mitaka, Japan, assignors to Aloka Co., Ltd., Tokyo, Japan

Filed Sep. 16, 1981, Ser. No. 302,802

Claims priority, application Japan, Sep. 16, 1980, 55-127301

Int. Cl.³ A61B 10/00

U.S. Cl. 128—661 5 Claims

1. An ultrasonic compound scanning diagnostic apparatus comprising:

an electronic sector scanning probe in which a plurality of ultrasonic transducers are arranged at equal distance from each other;

a compound scanner holding the probe to perform free compound scanning along a selected body surface over the organs to be diagnosed;

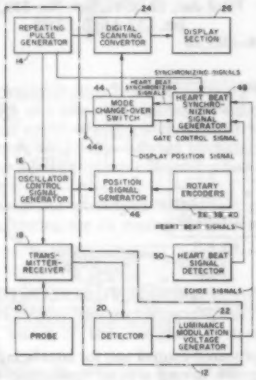
a plurality of rotary encoders coupled to said compound scanner to detect compound scanning positions of the probe;

a transmitting and receiving control circuit which electronically scans the probe and transmits and receives sector scanning ultrasonic beams to and from a body to be examined;

a digital scanning converter which memorizes and stores the echoe signals obtained from said transmitting-receiving control circuit and performs a selected signal conversion;

a display section which displays picture images in accordance with picture image signals output from said digital scanning converter;

a mode change-over switch which is connected to said digital scanning converter and switches to select a requested display mode by controlling memory storage and signal conversion of the echo signals in said digital scanning converter;



a position signal generator which outputs picture image display position signals to said mode change-over switch in accordance with compound scanning position detecting signals obtained from the rotary encoders of said compound scanner; and

a heart beat synchronizing signal generator which outputs heart beat synchronizing signals to said mode change-over switch in accordance with heat beat signals;

whereby operation of said change-over switch makes it possible to display dynamic picture images or still picture images at optional time phases by real-time sector scanning and compound sector scanning.

4,463,764

CARDIOPULMONARY EXERCISE SYSTEM

Stephen T. Anderson; Catherine A. Anderson, both of Stillwater, and Terrance J. Kapsen, Minneapolis, all of Minn., assignors to Medical Graphics Corporation, Shoreview, Minn.

Filed Sep. 29, 1981, Ser. No. 306,607

Int. Cl.³ A61B 5/08

U.S. Cl. 128—719 6 Claims

1. A cardiopulmonary performance testing and display system comprising in combination:

(a) a mouthpiece member adapted for placement in a subject's mouth, said mouthpiece member including means for generating a first analog electrical signal proportional to inspiratory and expiratory gas flow by said subject;

(b) first gas analyzing means coupled to said mouthpiece member for producing a second analog electrical signal proportional to the level of carbon dioxide in said expiratory gas flow;

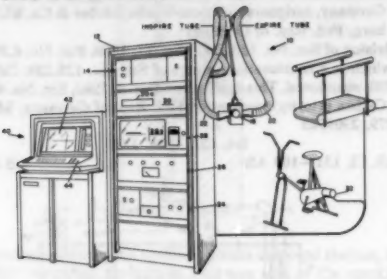
(c) second gas analyzing means coupled to said mouthpiece member for producing a third analog electrical signal proportional to the level of oxygen in said expiratory gas flow;

(d) waveform analyzer means including

(1) a first computer programmed to perform arithmetic

operations in accordance with a stored program of instructions;

(2) means controlled by said computer means and connected to the first-named means, and said first and second gas analyzer means for sampling said first, second and third analog electrical signals in a predetermined sequence and converting said first, second and third analog electrical signals into digital quantities representative of said analog electrical signals during the sampling interval of each;



(3) means in said first computer for at least temporarily storing said digital quantities as operands for said arithmetic operations;

(e) means for displaying the results of said arithmetic operations;

(f) second computer means remote from said first microprocessor means connected in a controlling relationship to said means for displaying; and

(g) means for transmitting said results of said arithmetic operations from said first computer means to said second computer means.

4,463,765

SCREW-IN PACING LEAD ASSEMBLY

Philip Gold, Pompano Beach, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Aug. 30, 1982, Ser. No. 412,425
Int. Cl.³ A61N *1/04*
U.S. Cl. 128—785 **19 Claims**

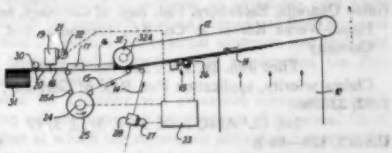
1. A body-implantable lead assembly comprising a lead having a proximal end and a distal end, said proximal end being adapted to be connected to electrical means for supplying or receiving electrical pulses, said distal end being adapted to be connected to tissue of a living body, said lead comprising a sheath of material inert to body materials or fluids and at least one wire conductor having a proximal end and a distal end and extending from said proximal end of said lead within said sheath to said distal end of said lead, a terminal structure electrically coupled to said proximal end of said wire conductor and adapted to couple electrically said proximal end of said wire conductor to the electrical means, an electrode assembly including an electrode, said distal end of said wire conductor being electrically connected to said electrode, said electrode including a tubular body which has a proximal end and a distal end and said sheath being coupled to said proximal end of said tubular body, a corkscrew shaped securing device within said tubular body and having a proximal end and a distal end, a cylindrically shaped mounting member made of insulating material being received in said tubular body, flexible drive means being received within and rotatable within said sheath, having a proximal end and a distal end and extending from said proximal end of said securing device being embedded in one end of said mounting member and said distal end of said drive means being embedded in the other end of said mounting member, with said ends of said drive means and said securing device being separated from each other within said mounting member, said flexible drive means being constructed to define a lumen or cylindrical envelope about the central area of said lead through and in which a stylet can be received, and a drive member at the proximal end of said lead fixed for rotation within said lead assembly, said drive member having one end thereof connected to the proximal end of said flexible drive means and the other end thereof extending from said lead assembly, said drive member further being adapted to be rotated to screw said securing device into living tissue and having a passageway therethrough opening into said lume at one end and to the ambient environment at the other end and into which passageway a stylet can be inserted for passage through said drive means for stiffening said lead.

4,463,766

CIGARETTE AND CIGARETTE FILTER MAKING MACHINE

High M. Arthur; Derek H. Dyett, and Godfrey A. Wood, all of Bucks, England, assignors to Molins Limited, London, England

PCT No. PCT/GB79/00197, 371 Date Jul. 17, 1980, 102(e) Date Jul. 17, 1980, PCT Pub. No. WO80/01115, PCT Pub. Date May 29, 1980
PCT Filed Nov. 19, 1979, Ser. No. 198,069
Claims priority, application United Kingdom, Nov. 17, 1978, 44926/78; Jan. 17, 1979, 7901709
Int. Cl.³ A24C *5/14*
U.S. Cl. 131—84 R **15 Claims**



1. A method of making rods of the cigarette industry in which a continuous rod is formed with the aid of a garniture tape and is cut at regular intervals by a rod cutting device to produce separate rod portions, the improvements comprising driving the rod cutting device by means of a first motor which determines the speed of production of discreet rod portions by said rod cutting device, driving the garniture tape by means of a second motor, and automatically controlling the speed of said second motor in response to the rate at which separate rod portions are cut from the continuous rod by said rod cutting device.

4,463,767

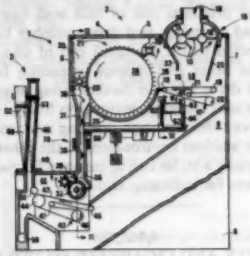
CONTINUOUS TWIN ROD CIGARETTE-MAKING MACHINE

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Bologna, Italy

Filed Mar. 11, 1982, Ser. No. 357,184
Claims priority, application Italy, Apr. 1, 1981, 48179 A/81
Int. Cl.³ A24C *5/14, 5/18, 5/34, 5/39*
U.S. Cl. 131—84 B **10 Claims**

1. A continuous twin rod cigarette-making machine for simultaneously manufacturing two continuous rods of cigarette, comprising a descending passage (31) for tobacco particles, an inner wall (36) arranged inside said descending passage (31) and defining therein two substantially equal descending shafts (37, 38), a carding unit (27) arranged upstream from said descending shafts (37, 38) in the direction of advancement of

said particles, two ascending shafts (48, 49) for said particles arranged partially alongside one another and downstream from said descending shafts (37, 38), suction conveyor means (52, 53) for said particles arranged at the upper end of each of said ascending shafts (48, 49) for the formation of respective continuous layers (54, 55) of tobacco, an advancement unit including two advancement rollers (32, 33) each arranged beneath a



lower end of a respective said descending shaft (37, 38), two drive means (34, 35) for said rollers (32, 33), said two drive means being independent from one another, detector means (56, 57) detecting the density and/or the weight of each of said layers (54, 55) and each controlling a respective said drive means (34, 35), and adjustment means for adjusting the quantity of tobacco supplied to each said descending shaft (37, 38).

4,463,768

APPARATUS FOR FORMING A TOBACCO FILLER

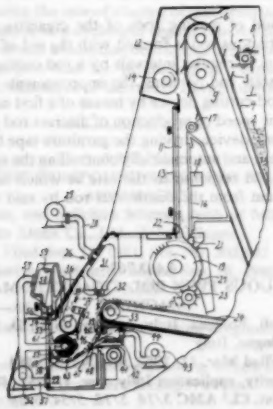
Guido Quarella, Escheburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jun. 28, 1982, Ser. No. 392,775

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1982, 3202805

Int. Cl.³ A24C *5/04, 5/14, 5/18, 5/39*

U.S. Cl. 131—84 B 9 Claims



1. Apparatus for forming a tobacco filler, comprising an arcuate duct having a wall; conveyor means for advancing and delivering tobacco to said duct; and accelerating means for transporting the thus delivered tobacco through said duct, comprising a source of compressed air and means for introducing compressed air from said source into said duct in substantial parallelism with said wall so that the compressed air entrains tobacco through said duct by conveying tobacco close to and along said wall.

4,463,769

METHOD AND APPARATUS FOR STORING AND TRANSPORTING COMMINUTED TOBACCO OR THE LIKE

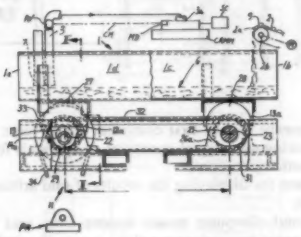
Uwe Leckband, Hamburg; Willi Thiele; Klaus Hagenah, both of Geesthacht, and Hans Förster, Hamburg, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 130,620, Mar. 17, 1980, Pat. No. 4,390,029, which is a continuation-in-part of Ser. No. 125,230, Feb. 27, 1980, abandoned. This application Dec. 8, 1982, Ser. No. 447,965

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1979, 2909943

Int. Cl.³ A24C *5/39*

U.S. Cl. 131—109 AB 15 Claims



1. A method of supplying tobacco or similar particulate material to several, consumers, especially for supplying shredded tobacco to a plurality of cigarette rod making machines, comprising the steps of accumulating a supply of particulate material; converting at least the major part of said supply into a fluidized bed of floating particulate material; establishing discrete paths between said supply and the consumers; pneumatically conveying particulate material directly from said fluidized bed to selected consumers whenever the need arises; and admitting particulate material to said supply so as to maintain the quantity of particulate material in the fluidized bed at a substantially constant value.

4,463,770

METHODS AND APPARATUS FOR TREATING SMOKING ARTICLES

Harold Thompson, 1120 Park Ave., New York, N.Y. 10028

Continuation of Ser. No. 113,048, Jan. 17, 1980, abandoned, which is a continuation of Ser. No. 870,079, Jan. 17, 1978, abandoned. This application Dec. 21, 1981, Ser. No. 332,509

Int. Cl.³ A24F *13/90*

U.S. Cl. 131—329 9 Claims

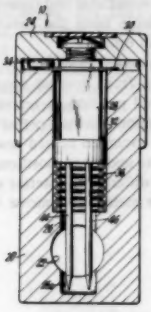
1. Apparatus for treating a smoking article to reduce the quantities of undesirable smoke constituents received by the smoker comprising:

a body having a first aperture for receiving a smoking article with its longitudinal axis aligned with the axis of the first aperture, and a second aperture at an angle to the axis of the first aperture and communicating therewith;

a plunger disposed in the second aperture for reciprocal motion along the axis of the second aperture, said plunger having first and second incisors extending from the end of the plunger parallel to the axis of the second aperture and adjacent to the first aperture, said first and second incisors having a diameter within the range of 0.020–0.047 inches;

said incisors being disposed such that a projection of the longitudinal axis of each of said incisors pass on opposite sides of the axis of the first aperture in a manner such that

a line between the ends of the incisors forms an angle between 30° to 60° with the axis of the first aperture; and means for reciprocating the plunger within the second aperture so that the incisors enter the first aperture to form



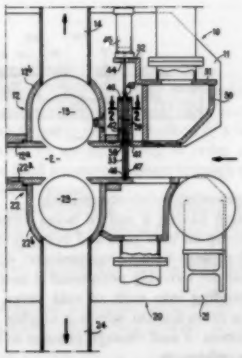
transverse ducts in a smoking article disposed therein, the duct extending through at least one side of the smoking article and having a length greater than the radius of the smoking article.

4,463,771

DEVICE FOR CLOSING THE ENDS OF A MACHINE FOR TREATING METAL SHEETS

Alfred Germain, Dunkerque-Malo-Les-Bains, and Bernard Roth, Boulogne-Billancourt, both of France, assignors to Union Siderurgique Du Nord Et De L'Est De La France, Paris, France

Filed Jan. 11, 1982, Ser. No. 338,514
Claims priority, application France, Jan. 9, 1981, 81 00288
Int. Cl.³ B08B *3/02*
U.S. Cl. 134—122 R **11 Claims**



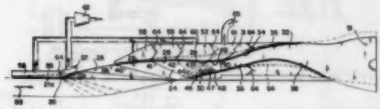
1. In a machine for treating metal sheets, which machine has an input end and an output end, a device for closing said input and output ends, an upper frame and a lower frame defining an enclosure in which enclosure may circulate a treating fluid, said device comprising for each of said ends upwardly and downwardly movable closing shutter means carried by one of said frames, guide means carried by said one frame and cooperative with said shutter means to guide said shutter means in a direction substantially perpendicular to a plane of the enclosure containing said input and output ends of the enclosure, and means for shifting said shutter means, the improvement wherein said shutter means is rigid and said guide means comprise a first slot provided in said one frame and extending transversely throughout the width of said enclosure and provided with sealing elements interposed between the slot and said shutter means, said shutter means being cooperative by a free edge thereof with the other of said frames which latter is provided with a second transverse slot which is penetrated by said shutter means in a lowermost position of said shutter means whereby the corresponding end of the machine is closed in a substantially sealed manner, in a lowermost position of said shutter means.

4,463,772

FLUSH INLET FOR SUPERSONIC AIRCRAFT

William H. Ball, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1981, Ser. No. 306,745
Int. Cl.³ B64D *33/02*
U.S. Cl. 137—15.2 **22 Claims**



1. A flush supersonic air inlet and convergent/divergent inlet air passage for supersonic aircraft of the type having a jet propulsion engine, comprising, in combination:

(a) a flush mounted air inlet formed in the surface of the aircraft body;

(b) a convergent/divergent inlet air passage having a throat at the juncture of the convergent and divergent portions of said passage and extending from said flush mounted air inlet to the jet propulsion engine inlet;

(c) an expansion corner defining an adjustable cant angle formed at the upstream leading edge of said flush mounted air inlet for turning the external airstream into said inlet and passage and expanding and accelerating the thus redirected airstream;

(d) means for adjusting said expansion corner cant angle during inflight operation as a function of the actual Mach number at which the supersonic aircraft is operating for inflight optimization of said supersonic air inlet;

(e) said convergent portion of said convergent/divergent air passage being shaped so as to generate a series of weak shock waves as the expanded and thus accelerated airstream moves towards said throat for progressively decelerating said airstream from supersonic velocities to at least transonic velocity at said throat; and,

(f) said divergent portion of said convergent/divergent air passage serving to further decelerate said airstream from transonic velocity to subsonic velocity as said airstream moves from said throat to the jet propulsion engine inlet.

4,463,773

SAFETY SHUT-OFF VALVE

Tadashi Kojima; Tetsuo Uchihama, both of Fujisawa; Kazuyoshi Tanaka, Yokohama; Eiichi Morozumi, Ayase; Kentaro Inoue, Yokohama, and Naomichi Shito, Tokyo, all of Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

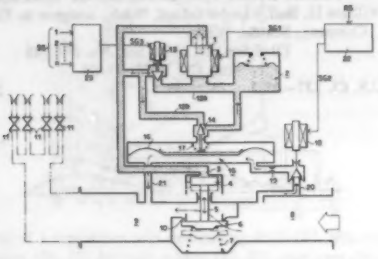
PCT No. PCT/JP81/00351, 371 Date Mar. 15, 1982, 102(e) Date Mar. 15, 1982, PCT Pub. No. WO82/01756, PCT Pub. Date May 27, 1982
PCT Filed Nov. 20, 1981, Ser. No. 361,926
Claims priority, application Japan, Nov. 21, 1980, 55-165006; Dec. 27, 1980, 55-188591; Jan. 29, 1981, 56-10892
Int. Cl.³ F16K *17/36*
U.S. Cl. 137—38 **12 Claims**

1. A safety shut-off valve opening a flow path between the primary and secondary sides in case of normal operation while shutting off said flow path in response to an emergency shut-off signal, which comprises:

an electromagnetic transference device for forcibly transferring fluid from an admission port into a pressure chamber through an exhaust port by means of electromagnetic force,

a main valve device consisting of a responsive body operated in response to a pressure in said pressure chamber and a first valve connected for operation by said responsive body,

an opening and closing means for controlling the opening and closing of a branch path for discharging the fluid in said pressure chamber in order to close said main valve



device by releasing said pressure upon receipt of said shut-off signal,

a by-pass path communicating the primary side with the secondary side of said main valve device,

a valve control device for controlling a second valve which opens said by-pass path during merely a period in which a reset signal is supplied, and

a leak detecting means for detecting leak by existing gas flowing through said by-pass path from the primary side to the secondary side due to said leak on the secondary side of said main valve device in the condition in which said second valve opens.

4,463,774

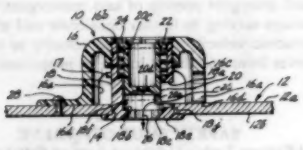
FUSELAGE-MOUNTED VALVE FOR CONDENSATE DRAINAGE AND CABIN-AIR PRESSURIZATION

Friedrich J. Gorges, Bellevue, Wash., and Robert V. Hodges, Norfolk, Va., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 28, 1983, Ser. No. 462,033

Int. Cl.³ F16K *17/36, 43/00*; **B64C** *1/00*

U.S. Cl. 137—81.1 **10 Claims**



1. An aircraft valve adapted to be mounted on a lower wall of a fuselage in registration with an opening in such wall for assuming a normally valve open condition for draining condensate collected inside the fuselage through such wall opening, and for responding to differentially higher interior cabin-air pressure relative to ambient air pressure outside the fuselage to assume a valve closed condition for sealing the interior of the aircraft for cabin pressurization, wherein said valve comprises:

a valve housing retainer affixed to an inner surface of said fuselage wall and in registration with the wall opening;

a valve housing, said valve housing retainer receiving said valve housing and having with said valve housing cooperating fastening means for detachably fastening said valve housing to said retainer, said valve housing and said cooperating fastening means being configured so that said valve housing is installable and removable and said fastening means operable from the exterior of said fuselage through said wall opening;

a valve member mounted in said valve housing for reciprocative movement from a valve open position to an air-tight valve closed position in response to said differentially higher interior cabin air pressure; and

biasing means also mounted in said housing for biasing said valve member to said open position, said biasing means yielding to said differential interior cabin air pressure to cause said valve member to move to said valve closed position.

4,463,775

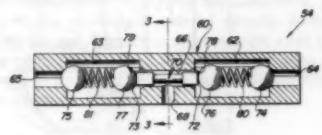
COMPENSATING VALVE

Richard A. Wittren, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 477,992, Mar. 23, 1983. This application Feb. 6, 1984, Ser. No. 577,723

Int. Cl.³ G05D *11/00*

U.S. Cl. 137—111 **8 Claims**



1. A compensating valve comprising:

(a) a housing having a pair of bores formed therein, each bore having an inlet port and being interconnected by a through passage which communicates with an outlet port;

(b) a shuttle pin movably positioned in said through passage and extending into each of said bores, said shuttle pin having a cross section which is smaller than the interior cross section of said through passage so as to permit fluid flow therethrough;

(c) first and second check balls contained in each of said bores for regulating fluid flow therethrough, each of said first check balls being movably positioned against said inlet ports and each of said second check balls abutting opposite ends of said shuttle pin and being movably positioned adjacent to valve seats positioned on opposite ends of said through passage, said first check balls normally being in a closed position blocking fluid flow through said inlet ports and said second check balls normally being spaced from said opposite ends of said valve seats; and

(d) compression springs positioned between each of said first and second check balls for urging said first check balls to a closed position blocking fluid flow through said inlet ports.

4,463,776

FLUID PRESSURE RELIEF SYSTEM ACTUATOR

Kelvin J. Hewlett, Leicestershire, England, assignor to Crosby Valve and Engineering Company, Limited, Leicestershire, England

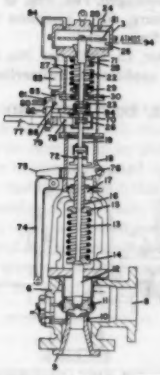
PCT No. PCT/GB81/00100, 371 Date Jan. 29, 1982, 102(e) Date Jan. 29, 1982, PCT Pub. No. WO81/03688, PCT Pub. Date Dec. 24, 1981

PCT Filed Jun. 11, 1981, Ser. No. 354,098

Claims priority, application United Kingdom, Jun. 13, 1980, 8019492; Jun. 13, 1980, 8019493

Int. Cl.³ F16K *17/10*; F22B *37/44*

U.S. Cl. 137—495 10 Claims



1. A fluid pressure relief system comprising:

a relief valve having a valve seat, and a valve element spring biased to a closed position on said valve seat, said valve element being movable under the action of a fluid pressure medium against its spring biasing in order to allow the escape of the fluid pressure medium through the valve for pressure relief purposes;

an actuator coupled with said valve element and having a member displaceable in response to fluid pressure applied to said member;

a linkage coupling together the valve element and the actuator;

biasing means arranged to oppose displacement of said member of the actuator, when fluid pressure is applied to the member;

control means for controlling the supply of fluid pressure to said member;

means for applying fluid pressure to the displaceable member to move the latter to a valve-loading position in which it applies a supplementary valve-closing load to the valve element via said linkage;

and a fail-safe mechanism coupled with said linkage and forming part of the linkage to move therewith when the displaceable member moves to the valve-loading position, said mechanism being coupled with said linkage in such a way as to be automatically disabled by the linkage when the displaceable member remains unintentionally in the valve-loading position and the valve element carries out relief pressure movement.

4,463,777

OUTSIDE SCREW-AND-YOKE TYPE VALVE

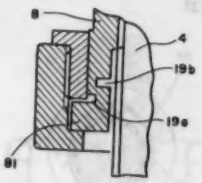
Tatsuhito Taniguthi; Yutaka Niwa, and Takashi Masumoto, all of Mie, Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Jun. 15, 1981, Ser. No. 273,302

Claims priority, application Japan, Jun. 26, 1980, 55-86819

Int. Cl.³ F16K *37/00*

U.S. Cl. 137—553 9 Claims



1. A screw-and-yoke type valve for use out of doors comprising:

a body having a stream path and end ports and also having seat ring means encircling said stream path;

a body head secured on the top of the body and having nut means, and means for thrustly securing said nut means to the body head; and

a shutting member containing a gate or disk for sealing cooperation with said seat ring means for closing the stream path in the body, a stem, a stem connection for thrustly securing said stem to the gate/disk, said stem having a threaded outside operating portion engaging the nut means in the body head, the axial displacement of said stem relative to said nut means of the stem causing the gate/disk to open or close the stream path, wherein said nut means includes means for limiting the axial forces transmittable to said shutting member through said stem, said force limiting means including a nut member having an integral weakened portion for selective breakage at axially directed forces less than the axial breakage strengths of either said stem or said stem connection, and

said valve further including detection means for permitting visual ascertainment of breakage of said weakened nut member portion,

wherein the body head has a yoke and wherein the valve includes a retaining nut fixed in a hole of the yoke, the retaining nut and the side wall of the hole constituting a ring groove in the wall, and wherein the valve further includes a stem nut threadably connected to said stem, and the stem nut has a radially protruding collar which engages the ring groove, and wherein the nut member is the stem nut and wherein the weakened portion is the portion of the stem nut connecting the radially protruding collar.

4,463,778

SAUSAGE CASING FORMED FROM REGENERATED CELLULOSE WITH AN INTERNAL VINYL ACETATE COATING

Henry E. Judd; Arthur M. Dowell, Jr., both of Danville, and Matiur Rahman, Champaign, all of Ill., assignors to Teepak, Inc., Chicago, Ill.

Continuation of Ser. No. 887,578, Mar. 17, 1978, abandoned. This application Aug. 6, 1979, Ser. No. 64,255

Int. Cl.³ F16L *11/04*

U.S. Cl. 138—118.1 2 Claims

1. A smoke and moisture permeable synthetic sausage casing for dry sausage comprising a thin continuous tube formed from regenerated cellulose or fiber reinforced regenerated cellulosic casing having an internal wall surface for contact with sausage meat ultimately stuffed therein, there being applied to the ultimate sausage meat contacting internal wall surfaces of the

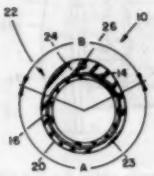
casing about 0.1 to about 10% by weight based on the weight of the casing of a vinyl acetate polymer.

4,463,779

FORMABLE, SHAPE RETENTIVE HOSE

Clifford W. Wink, Denver, and Guy T. Bixby, Longmont, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Mar. 5, 1982, Ser. No. 355,033
Int. Cl.³ F16L 55/00
U.S. Cl. 138—125 6 Claims



1. A formable hose with serpentine shape retentivity and of the type for coupling to nipples with circumferential type clamps, the hose comprising:

a polymeric tube having a circumference and length, the tube surrounded with a helical wire and twined reinforcement;

a polymeric cover surrounding the tube, helical wire and twined reinforcement, the cover having a first portion of substantially uniform thickness throughout a major portion of the tube circumference and a second portion of a greater thickness than the first portion thickness and continuing throughout a minor portion of the tube circumference, the first portion and second portion of substantially uniform cross section throughout the tube length; and

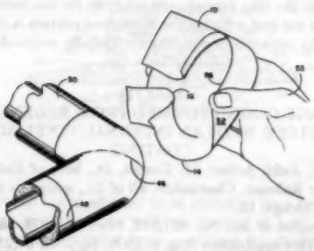
a reformable wire embedded solely in the second portion of the cover and extending generally longitudinally of the tube throughout its length, the reformable wire sufficiently stout to retain the hose in a serpentine shape.

4,463,780

ELBOW COVER

Roland P. Schultz, and William G. Schultz, both of 1109 Ridgecrest Cir., Costa Mesa, Calif. 92627

Filed Apr. 23, 1982, Ser. No. 371,196
Int. Cl.³ F16L 59/02
U.S. Cl. 138—178 5 Claims



1. An elbow cover formed of a flexible thin sheet and having the following two stable configurations:

(a) an open stacking configuration with an interior concavity and an exterior convexity formed by a substantially ellipsoidal central portion and opposite, laterally projecting ears having substantially parabolic hyperboloidal surfaces joined to said central portion by partially parabolic flexing surfaces; and

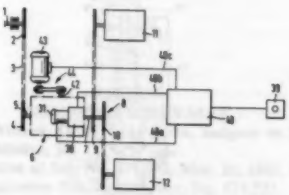
(b) a closed configuration forming a tubular elbow shape with opposite tubular ends and an asymmetric elliptical diagonal cross section through said flexing surfaces when said ears are folded inwardly to complete the tubular ends of said elbow shape; and having an unstable configuration assummed by compression of the closed configuration between its opposite outside tubular edges to cause said elbow shape to flex and spread open and laterally separate said ears, whereby said cover resiliently snaps into said tubular elbow shape when released from said compression, thereby permitting said cover to be compressed partially open, placed over a tubular angle joint and released to snap closed in a single-handed operation.

4,463,781

PICK-FINDING DEVICE FOR A WEAVING MACHINE

August Binninger, Geisingen, Fed. Rep. of Germany, and Josef Kieliger, Spartanburg, S.C., assignors to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Dec. 15, 1982, Ser. No. 449,845
Claims priority, application Switzerland, Dec. 16, 1981, 8018/81
Int. Cl.³ D03C 3/28; D03D 51/08
U.S. Cl. 139—1 E 11 Claims



1. A pick-finding device for a weaving machine having a main shaft and plurality of weaving units driven-off said main shaft, said device comprising

a first planetary transmission for connection between the main shaft and the weaving units for driving the weaving units in a forward manner, said transmission including an input drive gear set and an oppositely driven output gear set, said output gear set having an output gear therein;

a second transmission for selectively driving said output gear to drive at least one weaving unit in a reverse manner for pick-finding;

a control motor for driving said second transmission; and

an indexing means for selectively holding said output gear in a stationary position during driving of the weaving units in the forward manner and for releasing said output gear during driving of at least one of the weaving units in the reverse manner.

4,463,782

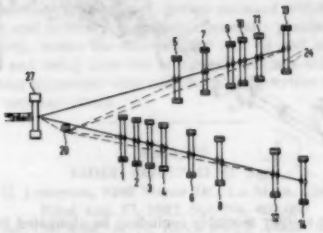
SHEDDING APPARATUS FOR CIRCULAR WEAVING OF MULTI-HARNESS FABRICS AND METHOD OF USING THE APPARATUS

Georg Borel, Reutlingen, Fed. Rep. of Germany, assignor to Hermann Wangner GmbH & Co., KG, Reutlingen, Fed. Rep. of Germany

Filed Feb. 25, 1982, Ser. No. 352,421
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1981, 3108189
Int. Cl.³ D03C 13/00; D03D 49/14, 37/00
U.S. Cl. 139—55.1 2 Claims

1. A shedding apparatus for weaving of multi-harness fabrics in endless form comprising a reed, a warp beam, a plurality of heddle frames moveable up and down to produce a desired weave with each heddle frame being provided with heddle

means adapted for each weave repeat to carry both a warp wire of the upper fabric half and a warp wire of the lower fabric half, a wire divider in the form of a rod extending across the entire fabric width between said heddle frames and said reed, said wire divider being positioned so that all the warp wires of the upper fabric half extend above the wire divider and all of the warp wires of the lower fabric half extend beneath the wire divider so that during weaving of one fabric half the warp wires of the other fabric half with be urged away



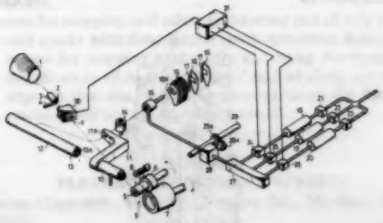
from the shed by the wire divider, and means for raising and lowering said wire divider upon each change of shed so that said wire divider in its extreme upper and lower positions is disposed adjacent the border of the shed opening produced by the movement of the heddle frames so that said wire divider is raised during the insertion of a weft wire into a shed formed in the warp wires of the upper fabric half out of the shed and said wire divider is lowered during the insertion of a weft wire into a shed formed in the warp wires of the upper fabric half to shift all the warp wires of the lower fabric half out of the shed.

4,463,783

METHOD OF INSERTING THE WEFT IN JET LOOM

Hajime Suzuki, Anjo, and Kinpei Mitsuya, Aichi, both of Japan, assignors to Seisakusho Kabushiki Kaisha Toyoda Jidoshokki, Kariya, Japan

Filed Mar. 15, 1983, Ser. No. 475,512
Claims priority, application Japan, Mar. 19, 1982, 57-45213
Int. Cl.³ D03D *47/30*
U.S. Cl. 139—435 **11 Claims**



1. A method of inserting a weft yarn in a jet loom, comprising the steps of:

(a) detecting the thickness of the weft yarn prior to insertion continuously or at intervals with a yarn thickness detector;

(b) controlling the pressure of ejection of a fluid such as air so as to be optimum for inserting the weft yarn with an ejection pressure control mechanism based on a result of detection of the thickness of the weft yarn; and

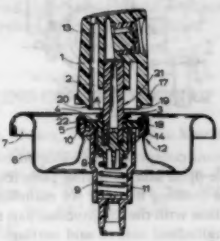
(c) ejecting the fluid through a nozzle member under the controlled pressure for inserting the weft yarn through a warp shed.

4,463,784

VALVE ASSEMBLY FOR PRESSURIZED DISPENSERS

Roger A. Butcher, Horndean, England, and Andre Debard, Buc, France, assignors to Aerosol Inventions and Development S.A. AIDSA, Fribourg, Switzerland

Filed Mar. 8, 1982, Ser. No. 355,342
Claims priority, application United Kingdom, Mar. 7, 1981, 8107238; France, Mar. 30, 1981, 81 06273
Int. Cl.³ B65B *31/00*
U.S. Cl. 141—20 **4 Claims**



1. In a valve assembly for a pressurized dispenser, said assembly comprising a mounting member a center boss on said mounting member, said boss having a top wall with inner and outer faces and a side wall, a sealing gasket within said boss and engaging the inner face of said top wall, a hollow valve shell within said boss and having an open upper end surrounded by a rim having inner and outer sides, said shell being secured within said boss, a valve member within said shell, spring means urging said valve member into engagement with said gasket, a valve stem having therein an outlet path, said stem being connected to said valve member and having a portion protruding through said gasket and top wall, a dispensing tip mounted on the protruding portion of said stem and having an underside facing the outer face of said top wall, and a fluid passage through said tip opening into the underside thereof for the delivery of gassing fluid to said dispenser; the improvement comprising an annular shoulder having an inwardly facing annular surface on the outer face of said top wall, and surrounding said stem, and an annular flange having an outwardly facing annular surface on said underside of said dispensing tip outwardly of the opening of said fluid passage to said underside, said shoulder and flange surfaces making substantially fluid tight engagement when said tip is urged into contact with said top wall against the action of said spring means, said flange surface being arranged to be urged outwardly against said shoulder surface to increase said fluid tight engagement in response to pressure of gassing fluid delivered through said fluid passage to said underside of said tip.

4,463,785

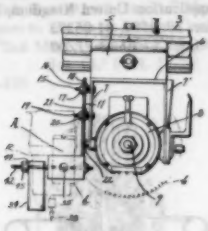
ROUTER ADAPTER FOR RADIAL ARM SAW

George W. Goeken, 412 Langdon, Alton, Ill. 62002

Filed Feb. 23, 1983, Ser. No. 469,045
Int. Cl.³ B27C *5/10*
U.S. Cl. 144—1 F **5 Claims**

1. For use with a radial arm saw having a carriage for longitudinal movement along the arm of the saw, there being a U-shaped bracket depending from said carriage for movement therewith and having parallel arms planarwise perpendicular to the longitudinal axis of said arm, a saw motor having a motor shaft, means securing said motor to said carriage arms for disposition therebetween and with the motor shaft having its longitudinal axis parallel to the plane of said bracket arms, the improvement comprising a router adapter for supporting a router for movement with said carriage for disposing said router in desired operative position, said adapter having a mounting plate, means detachably securing said mounting plate upon the exterior face of one of said bracket arms in

planarwise parallel relationship thereto, a fixed, outwardly opening receptacle-forming member secured to said mounting plate for presentation on the side thereof remote from the adjacent motor bracket arm, said member being dimensioned for accepting an inner portion of the router, an adjustable



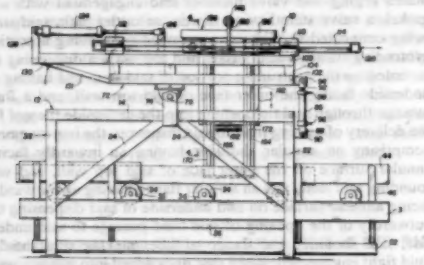
clamping element comprising a U-shaped bolt having parallel legs engageable upon said mounting plate for cooperating with said receptacle-forming member for maintaining said router in operative position with the longitudinal axis thereof perpendicular to the longitudinal axis of said carriage.

4,463,786

TIMBER DAPPING APPARATUS

Hayes R. Mellott, 13156 Long La., Mercersburg, Pa. 17236

Filed Jul. 2, 1982, Ser. No. 394,880
Int. Cl.³ B27C *5/00*
U.S. Cl. 144—133 A **24 Claims**



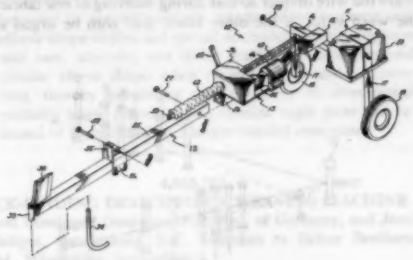
1. A timber dapping apparatus comprising, in combination,
a rigid frame,
conveyor means for conveying a timber along a predetermined path past a dapping station,
a rotary cutter head operable to cut a dap having a substantially flat bottom surface in a timber at said dapping station,
mounting means supporting said cutter head on said frame at the dapping station,
power means for driving said cutter head for rotation about an axis extending longitudinally of a timber at the dapping station,
said mounting means including first selectively operable means for producing limited pivotal movement of the cutter head about a pivot axis extending in a first direction, the axis of rotation of said cutter head being spaced from said pivot axis and extending in a second direction perpendicular to said first direction and second selectively operable means for producing limited translational movement of the cutter head in a third direction parallel to the axis of rotation, and
power means operable to produce relative movement between the cutter head and a timber at the dapping station to cause the cutter head to traverse and cut a dap in the timber.

4,463,787

ELECTRIC LOG SPLITTER

John I. Lenertz, Brainerd, Minn., assignor to Yukon Energy Corporation, Minneapolis, Minn.

Filed Aug. 28, 1981, Ser. No. 297,111
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—193 R **6 Claims**



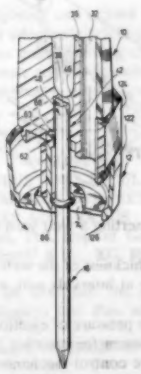
1. A log splitter assembly including an elongated frame, a splitting wedge mounted at one end of said frame, a ramhead movable along the longitudinal length of said frame, means to power said ramhead for movement along said frame including cooperating low friction threaded screw and nut members that upon rotation relative to each other cause longitudinal movement of said ramhead along said frame, reversible electric motor means for rotating one of said screw and nut members to linearly move one of the members and thus the ramhead, control means to selectively actuate said electric motor means in first and second directions of rotation to result in movement of said ramhead selectively toward or away from said wedge, and mechanical link means carried by said ramhead and engagable with said control means to move said control means to a position disabling said motor means when the ramhead is moved adjacent to said wedge.

4,463,788

MULTIPLE BIT SCREWDRIVER

Antonio Corona, Kettleby, and Paul F. Ho, Etobicoke, both of Canada, assignors to Antonio Corona & Associates R & D Ltd., Kettleby, Canada

Filed Jun. 9, 1983, Ser. No. 502,675
Int. Cl.³ B25G *1/08*
U.S. Cl. 145—63 **18 Claims**



1. A multi-bit screwdriver having a handle with a central longitudinal axis, a bit selector cup rotatably mounted at an end of the handle to rotate about said central axis, a plurality of bits

provided in a circular pattern about the handle axis, each of which is contained in the handle to extend essentially parallel to the handle's axis, a chuck provided at said handle end aligned with said handle axis for receiving a bit end and securing it against rotation, said cup having a continuous sidewall with an interior surface spaced radially outwardly of the radial location of said bits and a closed cup end, an elongate slot extending from the central portion of the cup end radially outwardly to the radial location of the bits in the handle, said cup being rotatable to position the slot in register with any desired bit in the handle, said slot in said cup end being of sufficient width and length to permit outward withdrawal of a bit from said handle in a direction generally parallel with the handle axis, means for retaining the tool bit end in said cup, said bit end being movable along said slot towards the cup centre into alignment with said chuck for insertion of the tool bit end into said chuck.

4,463,789

VIDEO EQUIPMENT BAG

Steven G. Leiserson, 9190 Manor Dr., La Mesa, Calif. 92041

Filed Aug. 17, 1982, Ser. No. 409,003
Int. Cl.³ A45C *11/38*; B65D *30/22*; A44B *19/28*
U.S. Cl. 150—52 J **2 Claims**

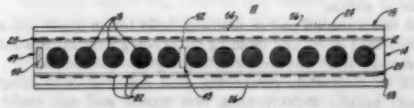
1. An equipment bag comprising:
a box-shaped body with a bottom, sidewalls, endwalls and an openable lid;
a zipper track on the top edge of each sidewall;
a mating zipper track along each of the respective edges of said lid;
a pair of zipper riders mounted reversely to each other on each of said zipper track and mating track, and each rider being directed to fasten said tracks together when drawn away from the other rider;
means for stopping said riders at one end of each of said tracks;
means for stopping said riders at the other end of only one of said tracks with the adjacent track remaining free of any means for stopping said riders and being disengageable therefrom to allow the freeing of said lid along one entire edge so that the lid can be pivoted along the fastened tracks at the top of the other sidewall.

4,463,790

FLEXIBLE AUTOMOBILE SCREEN

Charles Clapsaddle, 6689 W. Marlette Rd., Marlette, Mich. 48453

Filed Sep. 23, 1982, Ser. No. 422,017
Int. Cl.³ E06B *5/10*
U.S. Cl. 160—105 **11 Claims**



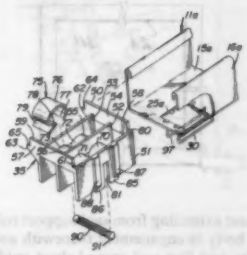
1. An automobile window screen removably disposable between opposing frame elements, comprising: a pair of flexible and resilient elongated blocks, each of said blocks having a pair of longitudinal edges and a plurality of ventilation holes formed between said longitudinal edges; said blocks being in abutment at positions along but slightly spaced from their corresponding longitudinal edges; and a flexible elongated screen disposed between said blocks and abutting each of said blocks along said positions of abutment; wherein the adjacent longitudinal edges of said blocks are spaced apart from one another sufficiently to permit the engagement of a window frame element therebetween; said window screen possessing sufficient rigidity to extend to opposing window frame elements when disposed therebetween, and sufficient flexibility to be longitudinally rolled when not so disposed.

4,463,791

VENETIAN BLIND CORD LOCK FOR UP TO EIGHT LIFT CORDS

David K. McClure, Muncy, Pa., assignor to Marathon Manufacturing Company, Houston, Tex.

Continuation-in-part of Ser. No. 460,445, Jan. 24, 1983. This application Jun. 10, 1983, Ser. No. 502,736
Int. Cl.³ E06B *9/38*
U.S. Cl. 160—178 C **11 Claims**



1. In a venetian blind, the combination comprising a headrail channel including a generally horizontal elongate bottom wall, generally longitudinally extending front and back walls upstanding from longitudinal edges of said bottom wall, and inturned upper lips on said front and back walls, said bottom wall having a cut-out adjacent to and spaced from said front wall for passing lift cords; and a cord lock in said channel comprising a plurality of at least three spaced longitudinal members, a plurality of at least four spaced cross members extending transversely of and secured to said longitudinal members to define a grid-like structure, said grid-like structure resting on said bottom wall and having upper formations engageable with said upper lips for limiting vertical and lateral movement of said structure in said channel, a depending formation on one of said longitudinal members engaging in said cut-out to limit longitudinal movement of said structure, generally vertically extending way means in said longitudinal members between the intermediate pair of said cross members, and a jamming element freely shiftable up and down in said way means toward and away from cord jamming relation with the cross members of said intermediate pair, whereby lift cords are adapted to be theaded over said intermediate pair of cross members on both sides of the inner of said longitudinal members and under the outer of said cross members, for location of said cord lock at either end or medially of said channel and accomodation by said cord lock of up to 8 cords.

4,463,792

APPARATUS FOR INSULATING A SURFACE AREA

Simon F. Lukos, 562 Hamilton Ave., Watertown, Conn. 06795

Filed Aug. 20, 1982, Ser. No. 410,031
Int. Cl.³ E06B *9/08*
U.S. Cl. 160—271 **13 Claims**

1. An apparatus for selectively adjusting thermal insulation

over the surface of an area, said area having first and second opposite sides and third and fourth opposite sides thereof, comprising:

a. an elongated support roller;
b. an elongated guide body;
c. bracket means for supporting both said roller and guide body in spaced apart relationship at a location adjacent the first side of said area;
d. an elongated flexible sheet of thermally-insulating material mounted to said roller for winding-on and unwinding from said roller;
e. said sheet having a width which is coextensive with said first and second sides of the area and a length which is coextensive with the third and fourth opposite sides of the area;
f. said sheet having first and second opposite edges thereof;
g. first and second sheet edge guide and sealing means positioned adjacent the third and fourth area sides, respectively;
h. said sheet edge guide and sealing means adapted to receive said sheet edges for sliding motion therein and to inhibit air current flow past sheet edges in said guide and sealing means;

i. said sheet extending from said support roller and about said guide body in engagement therewith and from said guide body to said first and second sheet guide means;
j. said first and second sheet edges positioned in said first and second sheet edge guide means, respectively;
k. a spring means for establishing a rotary force on said support roller for causing a winding motion thereof to cause winding of said sheet thereon; and,
l. said sheet edge guide means establishing a frictional force on said sheet at said edges which counteracts said rotary force applied to said support roller by said spring means,
m. whereby said sheet is unwound from said roller and is advanced in said sheet edge guide means by the application of a manual force in a first direction to said sheet, it is restrained at an advanced position by said sheet edge guide means upon release of said manual force and air current flow past said sheet is inhibited when said sheet is advanced to said second side of the area to be insulated, and said sheet is wound on said roller and is retracted by the application of a manual force in a second opposite direction to said sheet.

4,463,793

VACUUM DIE CASTING MACHINE

Hans Thurner, Baldham, Fed. Rep. of Germany, assignor to Bayerisches Druckguss-Werk Thurner KG, Markt Schwaben, Fed. Rep. of Germany

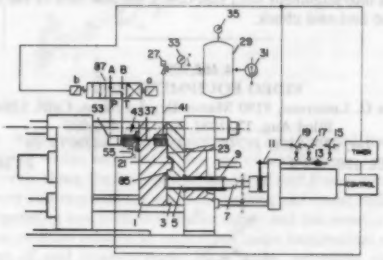
Continuation-in-part of Ser. No. 141,782, Apr. 21, 1980, abandoned. This application Jan. 29, 1982, Ser. No. 343,961
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1980, 3002886
Int. Cl.³ B22D *17/14, 17/32*
U.S. Cl. 164—155 **1 Claim**

1. In a vacuum die casting machine including matching die assemblies relatively movable between open and closed positions and defining a die cavity when in their closed position, a plunger for injecting molten metal into said cavity and having a reciprocating cycle that includes an initial injection stroke, with a final molten metal injection movement and a retraction stroke, means associated with one of said die assemblies for evacuating atmosphere from said cavity during operation of said plunger and valve means in said one die assembly and movable linearly between open and closed positions for interrupting the evacuation of atmosphere from said cavity, the improvement which comprises:

fluid cylinder operated actuating means removably mounted on said one die assembly and having a piston adapted for linear travel, and in alignment with said valve means;

removably mounted coupling means operatively connecting said piston to said valve means;

electrically operated means for controlling said fluid cylinder means;



first electrical switch means operable by said plunger for actuating said means for controlling said fluid cylinder means for initiating closing movement of said valve means at a desired time during injection of molten metal;

timing means actuated by said plunger for initiating a predetermined time interval;

second electrical switch means operatively associated with said coupling means for initiating said final molten metal injection movement of said plunger when said valve means is closed; and

third electrical switch means actuated by said timing means at the end of said time interval for actuating said electrically operated control means to cause retraction of said plunger in the event said valve means does not close completely to actuate said second electrical switch means before expiration of said time interval.

4,463,794

APPARATUS FOR PRODUCING CONTAINERLESS SAND MOLDS

Toshiyuki Shioda, Obu, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Continuation of Ser. No. 182,056, Aug. 28, 1980, abandoned. This application Sep. 21, 1982, Ser. No. 420,748
Claims priority, application Japan, Sep. 17, 1979, 54-119015
Int. Cl.³ B22C *17/00, 21/08*
U.S. Cl. 164—182 **4 Claims**

1. A two station apparatus for producing containerless sand molds comprising:

a framework generally extending upwardly from a base floor for providing a rigid construction for the apparatus, said framework establishing a working area having only two stations, a mold-forming first station and a mold-removing second station;

a first and a second pair of molding flasks for an upper and a lower sand mold, said molding flasks being movable toward and away from one another along a guide rod means;

means for alternately positioning each said pair of molding flasks in said mold-forming first station and said mold-removing second station, said means comprising a rotating shaft arranged between said mold-forming first station and said mold-removing second station, and at least a guide rod

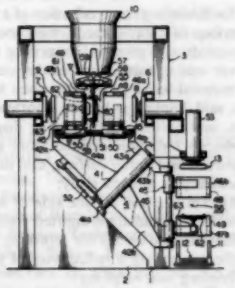
carried by said rotating shaft and slidably supporting thereon each said pair of molding flasks, said guide rod having an axis thereof extending in parallel with said predetermined horizontal axis when said guide rod is positioned in said mold-forming first station, and in parallel with said predetermined vertical axis when said guide rod is positioned in said mold-removing second station, said rotating shaft having an axis of rotation thereof extending along a line which bisects an angle between said predetermined horizontal axis and said predetermined vertical axis;

a match plate vertically arranged in said mold-forming first station at a position adapted for being held between each said pair of molding flasks when each said pair of molding flasks is positioned in said mold-forming first station;

a pair of squeezing devices mounted on said framework and arranged on laterally opposite sides of and in alignment with said match plate, said squeezing devices being laterally movable toward and away from one another along a predetermined horizontal axis extending in said mold-forming first station;

a sand blower means mounted on said framework and arranged above said match plate, for supplying sand into each said pair of molding flasks;

a flask-support device arranged in a vertically lower section of said mold-removing second station, said flask-support device being movable along a predetermined vertical axis extending



in said mold-removing second station for supporting said molding flasks when each said pair of molding devices is positioned in said mold-removing second station;

a mold-support device arranged in common with said flask-support device in said vertically lower section of said mold-removing second station, said mold-support device being movable along said predetermined vertical axis and independently of said flask-support device;

a mold-removing device arranged in a vertically upper section of said mold-removing second station, said mold-removing device being movable along said predetermined vertical axis in cooperation with said mold-support device for removing said upper and lower sand molds from each said pair of molding flasks; and

means for replacing said match plate with a different match plate, said replacing means comprising

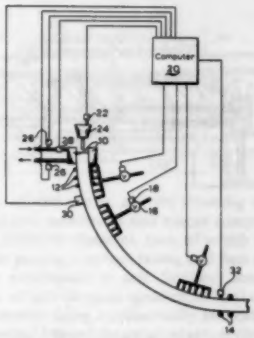
a support plate arranged in said mold-forming first station for vertically supporting thereon said match plate; means for releasably clamping said match plate, said clamping means being attached to said support plate; means for releasably holding said match plate on one of said first and second pairs of molding flasks, said holding means being provided for said one of said first and second pairs of molding flasks, and; means for transferring said match plate between said support plate and said one of said first and second pairs of molding flasks.

4,463,795

METHOD OF COOLING A CONTINUOUS CASTING

Alain Chielens, Marcq en Baroeul; Philippe Benoit, and Bernard Roggo, both of Lambersart, all of France, assignors to Fives-Cail Babcock, Paris, France

Filed Mar. 9, 1981, Ser. No. 242,143
Claims priority, application France, Mar. 13, 1980, 80 05592
Int. Cl.³ B22D 11/16
U.S. Cl. 164—455 13 Claims

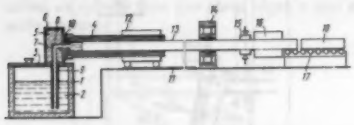


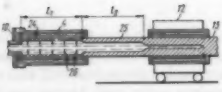
1. A method of cooling a cast metallic product in a continuous casting installation comprising a casting mold containing molten metal and a secondary cooling zone including a succession of cooling sections through which the cast product is guided, said cast product being fictitiously divided into small elements, which comprises the steps of delivering flows of cooling water at respective flow rates to the successive cooling sections, periodically determining the heat to be extracted from each one of said elements by means of a first curve giving the variations of a quantity of heat extracted from a unitary mass of the cast product as a function of its dwell time in the installation, correcting the first curve before each calculation in direct dependence on the quantity of heat extracted from the molten metal in the mold, determining the surface temperature of said element by means of a second curve giving the variations of the surface temperature of the cast product as a function of its dwell time in the installation, calculating a coefficient of thermal exchange for said one element on the basis of the determined quantity of heat and determined surface temperature, determining a specific water flow rate for said one element by means of a predetermined curve based on the design of the cooling system, and giving the variations of the specific water flow rates as a function of the coefficient of thermal exchange, calculating the flow rate of water to be projected on each one of said elements, integrating the water flow rates for the elements in each successive cooling section in the secondary cooling zone to determine the water flow rates for each successive cooling section in the secondary cooling zone, and controlling the delivery of cooling water to the successive cooling sections so that the water is delivered thereto at the determined flow rates.

4,463,796
CONTINUOUS METAL CASTING METHOD AND PLANT FOR PERFORMING SAME

Evgeny A. Korshunov, pereulok Otdelny, 5a, kv. 29, Sverdlovsk; Alexandr N. Kuznetsov, prospekt Mira, 118, kv. 49, Krasnoyarsk; Maxim B. Ovodenko, ulitsa Gorkogo, 19, kv. 5, Krasnoyarsk; Gennady G. Kuzmin, ulitsa Lebedevoi, 147a, kv. 9, Krasnoyarsk; Valery P. Kostrov, ulitsa Bazhova, 57, kv. 10, Sverdlovsk; Alexandr N. Timofeev, ulitsa Kachinskaya, 60a, kv. 3, Krasnoyarsk; Valery L. Bastrikov, ulitsa Kommunisticheskaya, 83, kv. 63, Sverdlovsk, and Tatyana V. Meschaninova, ulitsa Malysheva, 127a, kv. 21, Sverdlovsk, all of U.S.S.R.

Filed Feb. 22, 1982, Ser. No. 351,169
Int. Cl.³ B22D *11/126, 11/10, 11/124*
U.S. Cl. 164—460 **5 Claims**





1. A method of continuous casting of metals, including the following successively performed operations:

forming in an open-ended mold defining a primary cooling zone a portion of an ingot of a specified predetermined length approximating the length of the open-ended mold, while applying pressure from the molten metal side to the skin of said portion of the ingot being formed, and while producing a cold junction at the end of said portion of the ingot;

drawing said portion of the ingot of the specified predetermined length from the open-ended mold into a secondary cooling zone;

continuously feeding molten metal into said open-ended mold for continuous formation of said portion of the ingot;

drawing periodically said portion of the ingot into said secondary cooling zone and producing in said secondary cooling zone an ingot made up of successive said portions separated by cold junctions;

providing for constrained shrinkage of said ingot in said secondary cooling zone in the intervals between successive drawing operations;

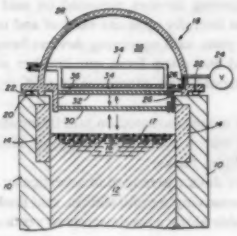
producing within said secondary cooling zone and during the intervals between successive drawing operations in the areas of said cold junctions between said portions of the ingot a bending stress of a value not less than the value of the yield strength of ingot material;

dividing said ingot into the specified predetermined lengths corresponding to said portions of the ingot of the predetermined specified length, by twisting at said cold junctions.

4,463,797
INHIBITING SHRINKAGE PIPE FORMATION OF METAL CASTING

Charles A. Berg, Buckfield, Me., assignor to Pyreflex Corp., Buckfield, Me.

Continuation of Ser. No. 248,836, Mar. 30, 1981, abandoned, which is a division of Ser. No. 105,510, Dec. 20, 1979, Pat. No. 4,290,475, which is a continuation-in-part of Ser. No. 10,712, Feb. 9, 1979, Pat. No. 4,256,919, which is a continuation-in-part of Ser. No. 934,025, Aug. 16, 1978, abandoned, and Ser. No. 898,289, Apr. 20, 1978, abandoned. This application Apr. 27, 1983, Ser. No. 489,028
Int. Cl.³ B22D *7/10, 27/04*
U.S. Cl. 164—492 **7 Claims**



1. A process for inhibiting the production of a shrinkage pipe on the upper surface of a liquid metal mass cooling in a mold having a top opening, said process comprising the steps of:

A. placing over said opening a diaphragm consisting essentially of a material having a melting point higher than the metal mass, said diaphragm having a bottom surface and a top surface, said bottom surface being disposed to intercept and absorb radiation emitted from and to re-emit radiation toward said upper surface, said diaphragm functioning essentially as a black body;

B. placing adjacent the top surface side of said diaphragm means for returning radiation emitted from said top surface back thereto, said means for returning comprising an infrared reflector having a reflectivity of at least 0.5 and means for cooling said reflector;

C. allowing radiation emitted from said upper surface to be absorbed by said diaphragm;

D. allowing radiation emitted from said top surface to be returned back thereto by said means for returning; and

E. allowing radiation emitted from said bottom surface to be absorbed at said upper surface.

4,463,798
ELECTROSTATICALLY PUMPED HEAT PIPE AND METHOD

John T. Pogson, San Jose, Calif.; Roger L. Shannon, Federal Way, Wash.; Robert H. Hamasaki, Seattle, Wash.; James L. Franklin, Auburn, Wash.; Dale F. Watkins, Sumner, Wash., and Ted J. Kramer, Auburn, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jan. 7, 1981, Ser. No. 223,205
Int. Cl.³ F28D *15/00*
U.S. Cl. 165—1 **23 Claims**

12. A method of electrostatically pumping a dielectric refrigerant in a heat pipe, comprising:

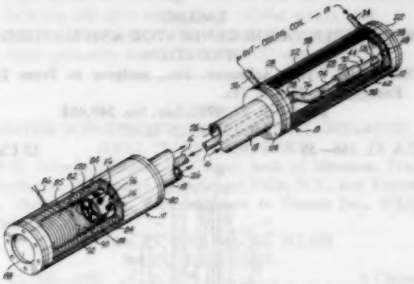
cooling a condenser chamber at one end of a heat pipe to liquefy the refrigerant at said one end to form a condensate;

flowing said condensate into an inlet of an ion drag pump, said pump being in said one end of said pipe in said condenser chamber;

applying a sufficiently high voltage difference across a cathode and an anode of the pump to produce a sufficiently high voltage gradient at the cathode to produce ions in the

refrigerant condensate that are accelerated toward the anode so as to create fluid motion and pumping action through the pump outlet;

pumping said condensate out of said condenser chamber through a condensate flow path in a small diameter closed tube in the pipe and into an evaporator chamber; said tube having one end extending from the pump outlet and having its other end extending to the evaporator chamber;



flowing said refrigerant in said evaporator chamber in individual heat receiving flow paths;

applying heat to the other end of the pipe to evaporate said refrigerant in said heat receiving flow paths into a vapor in the evaporator chamber; and

flowing said vapor in individual vapor flow paths from the heat receiving flow path in said evaporator chamber at said other end to a large flow path to said condenser chamber at said one end of said pipe.

4,463,799

HEAT STORAGE MEDIUM FOR LATENT HEAT THERMAL ENERGY STORAGE UNIT

Yoshio Takahashi, Urawa; Takeo Ozawa, Ibaraki; Ryuji Sakamoto, Kashiwa; Katsuhiko Kanari, and Masayuki Kamimoto, both of Ibaraki, all of Japan, assignors to Agency of Industrial Science Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Oct. 28, 1981, Ser. No. 315,865

Claims priority, application Japan, Oct. 29, 1980, 55-151845

Int. Cl.³ F28D *21/00*

U.S. Cl. 165—10 **3 Claims**

1. A heat storage medium for a latent heat TES unit, obtained by treating a crystalline polyolefin with ion plasma thereby crosslinking it only in the surface region thereof.

4,463,800

RADIATOR MOUNTED CONDITION SENSING PROBE

Clifford F. Hadden, Fontana, Calif.

Filed Sep. 27, 1982, Ser. No. 423,857

Int. Cl.³ F28F *7/00*; G01K *1/14*; F02B *77/00*

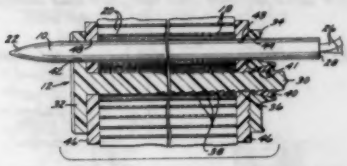
U.S. Cl. 165—11 R **5 Claims**

1. Apparatus for installing a condition sensing element in a heat exchanger of the type having a plurality of cooling fins extending between first and second opposite sides, and elongate spaces each extending from an opening in said first side to an opening in said second side between adjacent ones of said cooling fins, said apparatus comprising:

an elongate probe comprising said sensing element and having exterior dimensions substantially equal to a first one of said spaces so as to contact the cooling fins on either side of said space, said probe having first and second ends which protrude from said first and second sides, respectively, when so inserted;

a thin, elongate member dimensioned for insertion through a second one of said spaces, and having first and second ends which protrude from said first and second sides, respectively, when so inserted; and

retention means for (a) connecting said first and second ends of said elongate member to said first and second ends,



respectively, of said probe, and (b) retaining said probe and said elongate member in said spaces comprising first and second retention elements, each of which includes a rigid member having a surface facing said heat exchanger adapted for attachment to said first and second ends, respectively, of said elongate member, at least one of said retention elements being longitudinally moveable on said elongate member toward the other retention element so as to cause said first and second retention elements firmly to engage said first and second sides, respectively, of said heat exchanger; a resilient pad adhesively attached to each of said surfaces, respectively, and having area sufficient to cover the openings of a plurality of said spaces at least adjacent to said first one of said spaces; and locking means for locking said first and second retention elements in engagement with said first and second sides, respectively, of said heat exchanger.

4,463,801

AIR INDUCTION CONTROL SYSTEM FOR VEHICLE AIR CONDITIONERS

Akiro Yoshimi; Takeshi Kuwajima, both of Kariya; Fumio Ootsuka, Gifu, and Takeo Matsushima, Toyota, all of Japan, assignors to B Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Feb. 12, 1982, Ser. No. 348,300

Claims priority, application Japan, Feb. 16, 1981, 56-21708

Int. Cl.³ B60H *3/00*; F25B *1/00*

U.S. Cl. 165—43 **10 Claims**

1. A vehicle air conditioner control apparatus comprising:

air duct means for supplying air to a compartment of a vehicle;

selecting means for selecting a source of air for said air duct means, said selecting means having a first position for providing air from inside said compartment to said air duct means and a second position for providing air from outside said compartment to said air duct means;

blower means disposed in said air duct for causing a flow of air directed to said compartment;

air temperature changing means including a heat exchanging device disposed in said air duct means for effecting heat exchange with said air flow and temperature adjusting means for adjusting the temperature of said air flow supplied to said compartment through said air duct means;

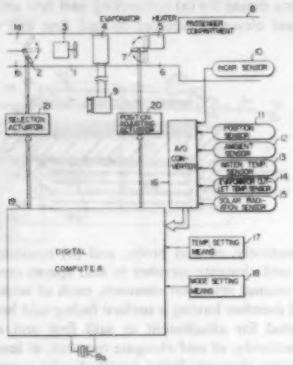
in car sensor means for generating a first signal indicative of an air temperature in said compartment;

ambient sensor means for generating a second signal indicative of an air temperature outside said compartment;

heat power sensor means for generating a third signal indicative of exchanged heat power of said heat exchanging device;

temperature setting means for generating a fourth signal indicative of a desired air temperature in said compartment;

electronic control means for: (1) computing a required temperature of supply air taken into said compartment from said air duct means in accordance with said first, second, and fourth signals, (2) producing a temperature control signal for controlling said temperature adjusting means in accordance with said required temperature and said third



signal, and (3) comparing said required temperature with a predetermined standard value, and producing a first command signal when said required temperature is smaller than said predetermined standard value and producing a second command signal when said required temperature is larger than said predetermined standard value;

first actuator means for actuating said temperature adjusting means to adjust the temperature of said air flow in response to said temperature control signal;

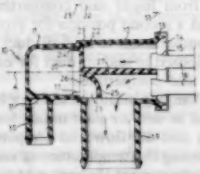
second actuator means for actuating said selecting means to said first position in response to said first command signal, and to said second position in response to said second command signal.

4,463,802

WATER BOX AND EXPANSION CHAMBER DEVICE, E.G. FOR AN INTERNAL COMBUSTION ENGINE RADIATOR

Denis Villeval, Maurepas, France, assignor to Valeo, Paris, France

Filed Aug. 3, 1982, Ser. No. 404,854
Claims priority, application France, Aug. 12, 1981, 81 15627
Int. Cl.³ F28D *13/00*
U.S. Cl. 165—104.32 **9 Claims**



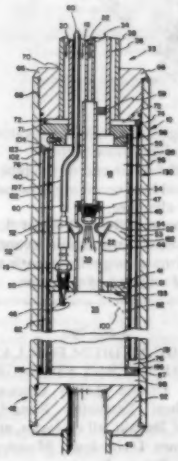
1. A water box and expansion chamber device for a heat exchanger such as a radiator in the cooling circuit of an internal combustion engine, wherein the expansion chamber and the water box are connected by an upper degassing passage, wherein the bottom of the water box is provided with an outlet tube for fluid outlet from the heat exchanger, and means forming a communication channel connecting the expansion chamber to said outlet tube through said water box, while maintaining separation between said expansion chamber and said water box.

4,463,803

DOWNHOLE VAPOR GENERATOR AND METHOD OF OPERATION

William G. Wyatt, Arlington, Tex., assignor to Trans Texas Energy, Inc., Dallas, Tex.

Filed Feb. 17, 1982, Ser. No. 349,653
Int. Cl.³ E21B *36/02*
U.S. Cl. 166—59 **15 Claims**



8. Apparatus for generating steam within a well bore of the type including a vapor generator disposed therein and having a heat exchanger constructed around a combustion chamber for heating water supplied from the wellhead and the gases present in the water to produce steam and hot gases for injection into a formation adjacent the wellbore, said apparatus comprising;

a generally cylindrical combustion chamber having an annulus formed therearound and within aid vapor generator;

means for delivering a combustible fuel, oxidant, and water to the area of said combustion chamber of said vapor generator within said wellbore;

an upper mixing chamber disposed above said combustion chamber and provided in communication with said fuel, oxidant delivery means for mixing the fuel and oxidant;

ignition means for igniting the fuel and air mixture to initiate a combustion flame;

a first, open ended tubular array disposed in said annulus for flowing water in a first direction about said combustion chamber;

means for flowing water in a second direction within said annulus, about said combustion chamber and said first tubular array which direction is substantially opposite to said first direction for therein establishing a water level within said annulus and absorbing radiant heat from combustion occuring within said combustion chamber and converting said water into steam;

means for flowing said steam, water and gases present in said water and emitted by said water when heated within said heat exchanger in a third direction substantially opposite said second direction and into a mixing region beneath

said combustion occurring within said combustion chamber;

a second, open ended tubular array disposed within said annulus for directing the flow of said water in said third direction;

said open end of first tubular array being longitudinally disposed in an opposite position relative to said open end of said second tubular array within said annulus to comprise means for flowing water in said second direction between said open ends of said tubular arrays; and

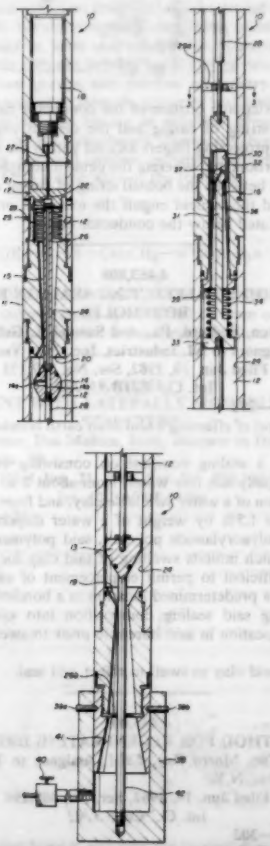
means for exhausting said steam and gas mixture from said vapor generator into said well bore formation.

4,463,804

VENTED NON-PRESSURIZED, UNCONTAMINATED WELL FLUID SAMPLER

Jack F. Rooney; William K. Cooper, both of Houston, Tex.; Stephen J. Papageorge, Wappingers Falls, N.Y., and Eugene L. Christ, Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,689
Int. Cl.³ E21B *49/08*
U.S. Cl. 166—165 **4 Claims**



1. A non-pressurized, uncontaminated well fluid sampler comprising,

(a) elongated housing means having a lower inlet valve means and an upper outlet valve means spaced apart for defining a sample chamber therebetween for being lowered in a well or the like for taking a sample of fluid, and

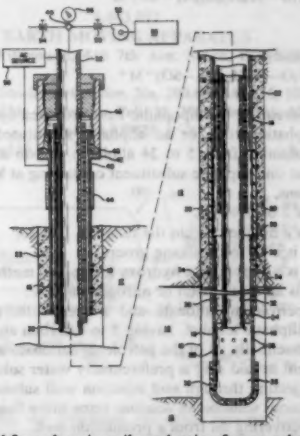
(b) an elongated tube means extending from said upper outlet valve means when closed for providing an elongated fluid pressure vent means for venting the sample fluid pressure into the well at a predetermined distance above said sample chamber for preventing detrimental pressure build-up and contamination of said fluid in said sample chamber during ascent to the surface.

4,463,805

METHOD FOR TERTIARY RECOVERY OF OIL

Clark Bingham, 4220 S.W. 75th Ave., Portland, Oreg. 97225

Filed Sep. 28, 1982, Ser. No. 425,541
Int. Cl.³ E21B *36/04, 43/24*
U.S. Cl. 166—248 **35 Claims**



1. A method for enhancing oil production from a subsurface oil-bearing formation containing an aqueous electrolytic liquid therein comprising the steps of:

(a) placing a first electrical conductor in electrical contact with said aqueous liquid in said oil-bearing formation through a bore hole which extends through earth material into said oil-bearing formation, and substantially electrically insulating said first electrical conductor from earth material other than said oil-bearing formation surrounding said bore hole;

(b) extending a second electrical conductor through earth material and establishing an electrical path between said first and second electrical conductors respectively;

(c) during a first time interval, establishing an electrical current between said first and second electrical conductors sufficient to create an exothermic electrochemical reaction, proximate said first electrical conductor, between said aqueous electrolytic liquid and oil present in said oil-bearing formation, and increasing the temperature and pressure in said oil-bearing formation proximate said first electrical conductor by means of said reaction;

(d) thereafter discontinuing the creation of said exothermic electrochemical reaction; and

(e) producing oil from said oil-bearing formation through said bore hole after the expiration of a second time interval following step (d), said second time interval being less than said first time interval.

4,463,806

METHOD FOR SURFACTANT WATERFLOODING IN A HIGH BRINE ENVIRONMENT

Billy G. Hurd, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 221,236, Dec. 30, 1980, abandoned. This application Jul. 1, 1982, Ser. No. 394,238
Claims priority, application Canada, Aug. 6, 1981, 383316
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—274 10 Claims

1. In an improved method of recovering oil from a subterranean formation containing oil having at least one injection well and at least one production well, the improvement comprising the steps of:

(1) injecting through an injection well and into said subterranean formation a slug which is an aqueous solution containing high salinity and sufficient of a surfactant combination comprising a preferentially water soluble ether-linked sulfonate or sulfate, of one of the formulae:

$$R_1O-(C_nH_{2n}O)_xR_2-\underset{\displaystyle R_3}{\underset{|}{C}}-SO_3^-M^+$$

and

$$R_1O-(C_nH_{2n}O)_x-SO_3^-M^+$$

wherein R_1 is a lipophilic base provided by a C_8 to C_{22} aliphatic group or an aliphatic substituted aryl group containing from 5 to 24 aliphatic carbon atoms with at least one aliphatic substituent containing at least 5 carbon atoms,

n is 2 or 3,

x is a number within the range of 1 to 20,

R_2 is a C_1 to C_4 alkane group,

R_3 is a hydrogen, a hydroxy group or a methyl group and M is an alkali metal or nitrogenous base;

a petroleum sulfonate and a preferentially oil soluble aliphatic alcohol, having 5 to 7 carbon atoms, wherein essentially all of the petroleum sulfonate which is present in said slug is preferentially water soluble;

(2) injecting through said injection well subsequent to said aqueous solution an aqueous brine drive fluid; and

(3) recovering oil from a production well.

4,463,807

MINIMIZING SUBSIDENCE EFFECTS DURING PRODUCTION OF COAL IN SITU

Xerxes T. Stoddard, Denver; Vesper A. Vaseen, Wheat Ridge, and Ruel C. Terry, Denver, all of Colo., assignors to In Situ Technology, Inc., Golden, Colo.

Division of Ser. No. 273,378, Jun. 15, 1981, Pat. No. 4,437,520. This application Mar. 28, 1983, Ser. No. 479,830
Int. Cl.³ E21B *33/00*
U.S. Cl. 166—285 3 Claims

1. A method of establishing a production well to withstand stresses induced by consumption of coal in situ, comprising the steps of

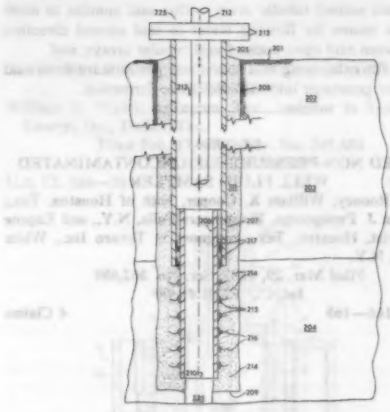
drilling a bore hole from the surface of the earth through the overburden and substantially through the coal seam,

installing conductor casing within the bore hole to a point adjacent to the interface of the overburden and the coal seam,

installing bonding apparatus to a bobtail string of casing, the bonding apparatus containing a multiplicity of rotatable projecting fingers capable both of retracting to positions substantially parallel to the bobtail string of casing and of extending to positions substantially perpendicular to the bobtail string of casing, the bobtail string being of sufficient length to reach the bottom of the bore hole and overlap into the conductor casing,

lowering the bobtailed string of casing within the conductor casing to the bottom of the bore hole, then

cementing the conductor casing and the bobtail string of casing into place, wherein the cement completely fills the annulus between the conductor casing and the bore hole, wherein the cement completely fills the annulus between



the overlapping portion of the conductor casing and the bobtail string of casing and the cement engulfs the retracted projecting fingers located within the said overlapping portion, and wherein the cement completely fills the annulus between the bobtail string of casing and the bore hole and the cement engulf the extended projecting fingers located below the conductor casing.

4,463,808

METHOD FOR EFFECTING SEALS IN EARTH BOREHOLES

Carl E. Mason, Bedford, Pa., and Samuel E. Geffen, Aurora, Colo., assignors to NL Industries, Inc., New York, N.Y.

Filed Jun. 10, 1982, Ser. No. 387,171
Int. Cl.³ E21B *33/138*
U.S. Cl. 166—292 3 Claims

1. A method of effecting a seal in an earth borehole comprising

preparing a sealing composition consisting essentially of substantially salt free water, from about 2 to about 4 lbs. per gallon of a water swellable clay, and from about 0.1% to about 1.5% by weight of a water dispersible hydrolyzed polyacrylamide polymer, said polymer being of a type which inhibits swelling of said clay for a period of time sufficient to permit emplacement of said servicing fluid at a predetermined location in a borehole;

introducing said sealing composition into said predetermined location in said borehole prior to swelling of said clay,

allowing said clay to swell to effect said seal.

4,463,809

METHOD FOR REGENERATING BRINE

Fan-Sheng Tao, Morro Bay, Calif., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 14, 1982, Ser. No. 388,294
Int. Cl.³ C02F *1/42*
U.S. Cl. 166—303 4 Claims

1. A method of enhanced oil recovery comprising the steps of contacting hard water with a strong acid ion exchange resin; evaporating said softened water into steam and injecting it into an oil bearing formation; regenerating said strong acid ion

exchange resin with a brine; then regenerating said diluted hardness containing brine by contacting said brine with a weak acid ion exchange resin, and evaporating water from said diluted brine using the heat from a production casing gas, said production casing gas comprising steam and a gas from the recovered oil, said production casing gas being supplied from a producing oil well of a steam injection oil recovery process; softening further quantities of hard water using said regenerated strong acid ion exchange resin; and regenerating said spent strong acid ion exchange resin using said regenerated brine.

4,463,810

PROCESS FOR FRACTURING SUBTERRANEAN FORMATIONS

Donald G. Hill, Tulsa County, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 23, 1981, Ser. No. 304,747
Int. Cl.³ E21B *43/267*
U.S. Cl. 166—308 **22 Claims**

1. In the process of initiating and/or extending a fracture in a subterranean formation penetrated by a wellbore comprising injecting a crosslinked aqueous gelled fracturing fluid through the wellbore and against the formation at a flow rate and pressure at least sufficient to initiate and/or extend a fracture in the formation, the improvement comprising including in said fracturing fluid at least one compatible, water-soluble, aliphatic, cationic polymer bearing a plurality of pendant quaternary ammonium groups, said pendant quaternary ammonium groups being separated from the polymer backbone by at least two carbon atoms and having an ethylene group, $—CH_2C-H_2—$, as one of the substituents chemically bonded to the nitrogen atom, and said cationic polymer containing in interpolymerized form a monomer of the formula:

$$CH_2{=}C(R){-}\overset{\overset{O}{\|}}{C}{-}X{-}CH_2CH_2{-}N^+R_1R_2R_3A^- \quad \text{I}$$

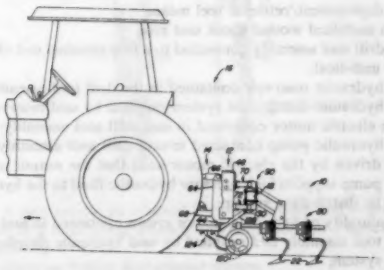
wherein: R is hydrogen or methyl; X is O or NH; R_1, R_2, and R_3 are each independently lower alkyl of from one to about four carbon atoms and A^- is a compatible anion.

4,463,811

IMPLEMENT WITH LATERALLY MOVABLE FRAME STRUCTURE

David C. Winter, Des Moines, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jun. 21, 1982, Ser. No. 390,106
Int. Cl.³ A01B *69/06*
U.S. Cl. 172—26 **31 Claims**



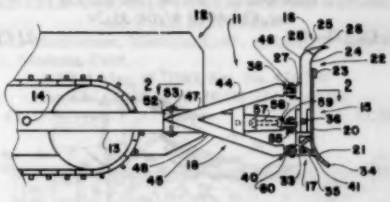
20. In an implement adapted for towing forwardly by a vehicle over the ground and having a generally transverse implement frame, upright hitch structure including a supportive framework adapted for connection to the vehicle, first and second rigid arms, means pivotally connecting the arms to the framework for rocking in a generally horizontal plane about transversely spaced upright axes while preventing vertical movement of the arms with respect to the hitch structure, bracket means pivotally connecting the implement frame to the rigid arms for permitting lateral movement of said frame while maintaining the arms generally parallel to each other, said arms forming four-bar linkage structure with said supportive framework and implement frame to maintain the frame transverse to the forward direction as the frame moves laterally, third and fourth rigid arms offset vertically from the first and second arms, said third and fourth arms pivotally connected to the implement frame and the supportive framework, wherein the first and third arms, and the second and fourth arms, respectively, comprise vertically aligned and parallel arm pairs, and wherein the bracket means includes upright bracket structure connecting the ends of the arms of the respective pairs, and wherein said upright bracket structure supports a portion of the implement frame forwardly of the pivotal connection with the implement frame and rearwardly adjacent the supportive framework, and means for rocking the arms to move the frame laterally.

4,463,812

EARTH MOVING APPARATUS

Andrew O. Williamson, 416 7th Ave. South, Greybull, Wyo. 82426

Continuation-in-part of Ser. No. 290,684, Aug. 6, 1981, abandoned. This application Feb. 15, 1983, Ser. No. 466,604
Int. Cl.³ E02F *3/76*
U.S. Cl. 172—136 **8 Claims**



1. Apparatus for mounting on earth moving machinery including a blade portion, a rake portion, a support portion and a mounting portion; said blade portion including a substantially straight elongated plate section, said plate section having a length substantially greater than its height and being disposed in a generally vertical position, a curved section extending from one longitudinal edge of said plate section along substantially the entire length thereof; said rake portion including a plurality of spaced tooth members associated with said blade portion, said tooth members being disposed generally transversely of the length of said blade portion, each of said tooth members including a shank section overlapping and in contact with said plate section of said blade portion, each of said shank sections being disposed between a pair of spaced cross members extending substantially perpendicular to said plate section, said cross members and said plate section forming a socket into which said shank section is removably disposed, aligned openings through said pair of cross members and said shank section, a pin extending through said openings in said cross members and said shank section, a hook section with a curved end extending from an end of said shank section, said hook section extending a substantial distance beyond the longitudinal edge of said plate section remote from said curved section, the curved end of each hook section projecting in the same direction as said curved section of said blade portion; said support portion including a bar member supporting said tooth members, said bar member being disposed on the opposite side of said shank portion of said tooth members from that of said blade portion, said bar member being disposed adjacent to and substantially parallel to the longitudinal edge of said plate

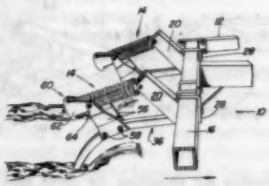
section remote from said curved section, a longitudinal section located adjacent to and substantially parallel to said bar member and extending from one side of said blade portion to the other, said longitudinal section being disposed with one edge thereof adjacent to the free edge of said curved section of said blade portion and extending toward said bar member; said mounting portion including side connecting means disposed adjacent the side edges of said bar member and said longitudinal section, arm members releasably engageable with said side connecting means, said arm members extending from said connecting means on one side of said apparatus converging toward each other and being joined at the ends thereof remote from said blade portion, said joined arm members being disposed in a generally vertical plane, said joined arm members including connecting means adjacent the ends thereof remote from said blade portion, pivotal central connecting means disposed centrally between said side connecting means both horizontally and vertically, said central connecting means including pivot means with outwardly extending shaft means, said central connecting means being disposed at the pivotal balance point of said apparatus; whereby said apparatus can be converted from a blading operation to a raking operation by disconnecting said side connecting means from said arm members, rotating said apparatus 180° about said pivotal central connecting means, and reconnecting said side connecting means with said arm members.

4,463,813

SPRING MOUNTED STANDARD ASSEMBLY

John D. Long, and Phillip E. Stevens, both of Ankeny, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Dec. 2, 1981, Ser. No. 326,735
Int. Cl.³ A01B *61/04, 35/24*
U.S. Cl. 172—705 **22 Claims**



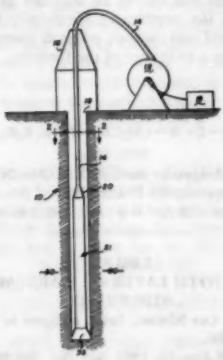
22. In a tillage implement having a frame adapted for forward movement over a field, a heavy duty spring trip shank assembly comprising: a mounting bracket adapted for connecting to the frame; a shank having a forward end and extending rearwardly from the forward end to an intermediate portion, said shank extending downwardly from the intermediate portion to a lower tool-receiving end; first pivot means connecting the forward end of the shank to the mounting bracket for permitting the shank to rock thereabout in generally a vertical plane between a lower soil-working position and an upper tripped position; support structure connected for rocking with the shank extending upwardly from the shank, said structure including an upright member fixed to the shank, a U-shaped member including sidelegs pivotally connected to and extending rearwardly from the upright member, and having a forwardly-directed, spring-abutting surface defining the bight portion of the U-shaped member rearwardly of the pivotal connection of said member with said upright member; spring-retaining means including a rearwardly-directed, spring-abutting surface, second pivot means connecting the spring-retaining means to the mounting bracket rearwardly of and above the first pivot means, wherein when the shank is in the soil-working position the pivotal connection of the U-shaped member is located between a first horizontal plane passing through the first pivot means and a second horizontal plane passing through the second pivot means and the distance between the spring-abutting surfaces decreases as the shank rocks upwardly from the soil-working position; a single coil spring compressed between the spring-abutting surfaces and biasing the shank to the soil-working position; wherein said coil spring acts through a first effective moment arm which decreases as the shank rocks upwardly from the soil-working position, and wherein rearward forces against the tool-receiving end act through a second effective moment arm to rock the shank against the bias of the coil spring, said second effective moment arm changing as the shank rocks, wherein said first and second moment arms and said coil spring cooperate to establish a trip force curve characterized by a high initial rearward trip force level whereat the shank begins to rock upwardly from the soil-working position, said trip force level increasing to a maximum level less than approximately twice said initial trip force level as ths shank rocks upwardly to an intermediate position and thereafter decreasing as the shank rocks upwardly beyond the intermediate position to a maximum tripped position, wherein at the maximum tripped position of the shank at least one-third of the spring extends rearwardly of said pivotal connection of the U-shaped member and the trip force level is about equal to said initial trip force level.

4,463,814

DOWN-HOLE DRILLING APPARATUS

Robert J. Horstmeyer, Palo Alto, Calif., and Larry J. Weick, West Garland, Tex., assignors to Advanced Drilling Corporation, Mountain View, Calif.

Filed Nov. 26, 1982, Ser. No. 444,608
Int. Cl.³ E21B *47/02*
U.S. Cl. 175—45 **10 Claims**



1. A down-hole drilling apparatus comprising, in combination:

a deployment/retrieval reel means;

an umbilical wound about said reel;

a drill tool assembly connected to a first terminal end of said umbilical;

a hydraulic reservoir contained in the drill tool assembly;

a hydraulic distribution system supplied by said reservoir;

an electric motor contained in said drill tool assembly;

a hydraulic pump contained in said drill tool assembly and driven by the electric motor such that the output of the pump supplies high pressure hydraulic fluid to the hydraulic distribution system;

a plurality of hydraulic anchor means contained in said drill tool assembly and supplied by said hydraulic distribution system;

a plurality of hydraulic thruster means contained in said drill tool assembly and supplied by said hydraulic distribution system;

a plurality of hydraulic ram means contained in said drill tool assembly and supplied by said hydraulic distribution system;

a hydraulic system control means contained in said drill tool assembly and connected electrically to said umbilical;

a means for sensing tool location, tool orientation, drill bit rpm, formation temperature and formation pressure contained in the drill tool assembly and said means being electrically connected to said umbilical;

a drill rotation contained in said drill tool assembly;

a cutter head coupled to said drill rotation means and located at the end of said drill tool assembly opposite the umbilical connection;

a means for supplying drilling fluid to the cutter head through the drill tool assembly;

a plurality of position sensing devices for each moving component of the anchor, thruster and ram means;

a processing device electrically connected to a second terminal end of said umbilical for receiving and analyzing data and generating control signals based on the analysis of said data and comparison of said data with preset instructions; and

whereby drill tool assembly location and orientation, drill bit rpm and formation temperature and pressure along with positions and pressures associated with said anchor, ram and thruster means are transmitted via the umbilical to the processing device on the surface which generates control signals which are transmitted to the hydraulic system control means within the drill tool assembly via the control awires in the umbilical such that the anchor, ram and thruster means are activated in a manner consistent with preset instructions to cause the drill tool assembly to be moved forward, backward and change the direction of drilling as desired.

4,463,815

MECHANICAL JARRING TOOL

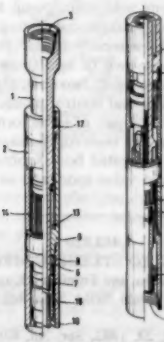
Rainer Jürgens, Celle-Osterloh, and Dietmar Krehl, Latchendorf, both of Fed. Rep. of Germany, assignors to Christensen, Inc., Salt Lake City, Utah

Filed Aug. 23, 1982, Ser. No. 410,751

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1981, 3142722; Oct. 28, 1981, 8131488[U]

Int. Cl.³ E21B *4/06*

U.S. Cl. 175—302 **11 Claims**



1. A mechanical jar adapted for insertion into and to deliver blows to a drill string when it becomes stuck in a bore hole comprising:

a sleeve including first impact means;

an arbor including second impact means longitudinally and telescopically displaceable in and relative to the sleeve;

a first primary slot-spline-gear drive means on engaging intermeshing portions of the telescopic arbor and sleeve for transmitting torque between the arbor and sleeve;

releasable latch means including first and second gear segments, with intermeshing gear teeth and inclined surfaces on the intermeshing gear teeth of the gear segments extending axially on sides of the respective arbor and sleeve;

torsionally stressable means on a portion of the arbor connected to move axially with, rotate relative to and torsionally isolated from the first slot-spline-gear drive means, for maintaining latching engagement of the intermeshing teeth until sufficient axial force has been applied to the drill string;

torque support means, between a portion of the torsionally stressable means and the sleeve, adapted to allow axial disengagement and reengagement of, support and prevent, during reengagement, rotation of the portion of the torsionally stressable means relative to the sleeve; and

connecting means coupling and allowing rotative movement of the isolated torsionally stressable means on the portion of the arbor supported by the torque support means relative to the telescopic portion of the arbor and the first slot-spline-gear drive means whereby the application of sufficient axial force causes inclined engaging surfaces of the intermeshing gear teeth to impart a torsional rotative movement of a portion of the arbor and first gear segment thereon away from and slide out of engagement the second gear segment on the sleeve without imposing torsional stress and increasing frictional forces between engaging surfaces of the first slot-spline-gear drive means and thereby allow relatively free axial movement between the arbor and sleeve under the influence of kinetic energy stored in the drill string.

4,463,816

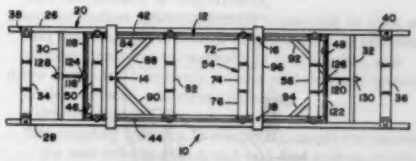
LOAD CELL ASSEMBLY FOR CONVEYOR WEIGHING OF BULK MATERIAL

John L. MacFarlane, Modesto, Calif., assignor to AutoWeigh Co., Modesto, Calif.

Filed Mar. 18, 1983, Ser. No. 476,770

Int. Cl.³ G01G *13/02, 19/00, 21/12, 11/00*

U.S. Cl. 177—119 **5 Claims**



1. Apparatus for weighing material moving on a belt-type conveyor, said apparatus including a conveyor frame, a weigh frame disposed within said conveyor frame, belt-type conveying means movably supported by said conveyor frame and said weigh frame for moving said material, and load cell means coupled to and disposed between said conveyor frame and said weigh frame for sensing the weight of said material on the portion of said belt-type conveying means that is supported by said weigh frame, wherein the improvement in said apparatus comprises:

said load cell means consists of three load cells positioned in relatively spaced apart triangular relation for supporting said weigh frame and for measuring the weight of said material supported thereby.

4,463,817

ACTIVE AMBULATING DEVICE, OR WALKER

Jean-Francois R. Mennesson, Castelnau le Lez, France, assignor to Institut National da la Sante et de la Recherche Medicale - I.N.S.E.R.M., Paris, France

Filed Feb. 25, 1983, Ser. No. 469,904

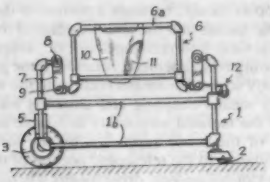
Claims priority, application France, Feb. 26, 1982, 82 03368

Int. Cl.³ B60K *1/00*

U.S. Cl. .180—65.5 **8 Claims**

1. An active ambulating device, or walker, intended for teaching or re-education of the motricity of a patient, compris-

ing a self-powered frame mounted on wheels of which at least one is driven by a motor and a carrier element in which the patient is placed, which comprises orifices for his legs to pass and which is supported at a height such that the patient's feet touch the ground, wherein said carrier element is fixed on a mobile support which is connected to said self-powered frame by connecting means which enable it to move freely with respect to said frame in at least one direction; said mobile



support is connected to said frame by at least one sensor which emits an electric signal proportional to one of the components of the relative movement of said support with respect to said frame; and it comprises servo-control loops which connect each of said sensors to one of said motors and which automatically control said motors to move said frame by a movement which corresponds, in direction and in intensity, to the relative movement of said support with respect to said frame.

4,463,818

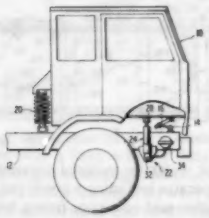
TILT CAB TRUCK IN WHICH THE CAB IS PARTIALLY SUPPORTED BY THE TILTING CYLINDER WHILE IN THE DRIVE POSITION

Lamburtus J. Sonneborn, Oldenzaal, Netherlands, assignor to Applied Power Inc., Milwaukee, Wis.

Filed Sep. 7, 1982, Ser. No. 415,232

Int. Cl.³ B62D *33/06*

U.S. Cl. 180—89.15 **8 Claims**



1. An apparatus for tilting a vehicle cabin having a front and a rear section from and into the drive position, said apparatus comprising at least one piston and one cylinder, said piston being positioned in a bore of said cylinder to form an upper and lower cylinder chamber on either side of said piston in said cylinder, and said piston and cylinder forming a hydraulic circuit together with a pump, a reservoir for hydraulic fluid, and a control valve, and wherein the ends of said piston and said cylinder are pivotally connected to said cabin and to a vehicle chassis respectively, there being a by-pass connection between said cylinder chambers on either side of said piston when the latter is in the region of its innermost position corresponding to the drive position of said cabin, said by-pass connection permitting said piston and said cabin in the drive position to perform a limited reciprocating movement while said pump is inoperative, characterized in that said lower cylinder chamber is also operatively connected to an accumulator, and an adjustable restriction is present in a line connecting said cylinder and said accumulator, and said control valve has, in addition to a position for tilting and a position for returning to the drive position, a third position in which the fluid passages to the cylinder chamber on either side of the piston are disconnected from the pump and the reservoir.

4,463,819

HYDRAULIC CONTROL VALVE

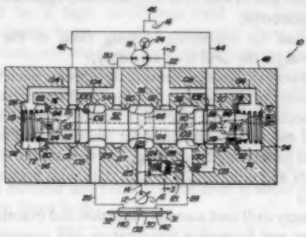
Manfred Becker, and Hilmar Ortlepp, both of Mannheim, Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.

Filed Sep. 13, 1982, Ser. No. 417,731

Claims priority, application European Pat. Off., Sep. 14, 1981, 81 107228.9

Int. Cl.³ B62D *5/06*

U.S. Cl. 180—132 **13 Claims**



1. An improved hydraulic control valve for providing metering of fluid to a steering arrangement, said steering arrangement including a piston-cylinder assembly, a main pump for supplying pressurized fluid from a fluid reservoir to said control valve, and a control pump connected to said control valve and being actuated by a manually operable steering mechanism, wherein said improvement comprises:

(a) a valve housing having an elongated bore formed therein;

(b) a valve spool movably positioned within said elongated bore and having at least three annular grooves formed thereon separated by a pair of lands, a longitudinal bore formed therein and a transverse bore which intersects said longitudinal bore and which opens into the centrally positioned annular groove, said valve spool cooperating with said elongated bore to form a control pressure chamber at each end thereof;

(c) check valves positioned at each end of said valve spool which close off said longitudinal bore when said valve spool is in a neutral position and which open when said valve spool is subjected to pressure loading at said ends; and

(d) a plurality of passages formed in said housing, one of said passages connecting said main pump to said elongated bore, two working passages connecting opposite ends of said piston-cylinder assembly to said elongated bore approximate the outer two of said three annular grooves formed on said valve spool, two control passages connecting opposite ends of said control pump to said elongated bore approximate said pair of lands formed on said valve spool, and at least one reservoir passage connecting said reservoir to said elongated bore approximately between an outer end of said valve spool and an adjacent annular groove.

4,463,820

POWER ASSISTED STEERING MECHANISM

Hiroshi Hachisuka, Nishio, and Fumiharu Kuga, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 22, 1982, Ser. No. 435,939

Claims priority, application Japan, Oct. 30, 1981, 56-174138; Oct. 30, 1981, 56-174139

Int. Cl.³ B62D *5/06*

U.S. Cl. 180—143 **5 Claims**

1. A power assisted steering mechanism comprising:

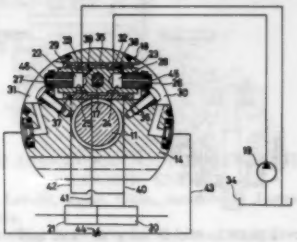
a worm shaft being in association with a steering wheel,

a power piston having a rack and being in engagement with said worm shaft thrugh means of a steering nut to thereby be moved along said worm shaft,

a sector shaft being in engagement with said rack of said power piston,

right and left cylinders selectively receiving the fluid under pressure to thereby assist the movement of said power piston, and

a control valve means incorporated within said power piston and being operated by a valve pin secured to said steering nut to selectively transmit the fluid under pressure into said right and left cylinders, said control valve means including a valve piston slidably positioned within a further cylinder so as to provide a pair of primary reaction



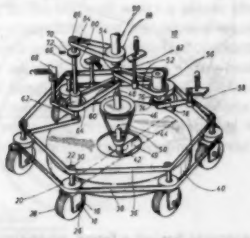
chambers, a pair of secondary reaction chambers formed at both sides of said valve piston, said primary reaction chambers being in fluid communication with said secondary reaction chambers through means of orifices, respectively, and said secondary reaction chambers being fluidically connected to each other through means of a variable orifice which reduces the fluid communication between said secondary reaction chambers in response to a speed of the vehicle.

4,463,821

DRIVABLE, STEERABLE PLATFORM FOR LAWNMOWER AND THE LIKE

Reza Falamak, Houston, Tex., assignor to Robot Crabtor International, Houston, Tex.

Filed Mar. 1, 1982, Ser. No. 353,250
Int. Cl.³ B62D *1/28*
U.S. Cl. 180—168 **14 Claims**



1. A drivable, steerable platform comprising:

a frame member, said member being generally disposed in a frame member plane;

at least three wheel assemblies, each of said wheel assemblies including:

first support structure rotatably connected to said frame member such that said support structure rotates about an axis substantially perpendicular to said frame member plane, said first support structure being endlessly rotatable through an angle of 360°;

a wheel member rotatably mounted on said first support structure such that said wheel member rotates in a wheel rotation plane about an axis substantially parallel to said frame member plane;

first drive structure to drive said wheel member about its axis of rotation in said wheel rotation plane; and

first steering structure to rotate said first support structure about its axis of rotation, whereby said wheel member is endlessly steerable through an angle of 360°;

a first endless device drivingly connected to each of said first drive structures to rotate each of said wheel members substantially in synchronism;

a second endless device drivingly connected to each of said first steering structures to rotate each of said first support structures substantially in synchronism; and

drive means for selectively driving said first and second endless devices, said means including:

a driving device;

first coupling structure to selectively couple and uncouple said driving device and said first endless device; and

second coupling structure to selectively couple and uncouple said driving device and said second endless device;

wherein the wheel rotation planes of said at least three wheel members are disposed substantially parallel to each other.

13. A drivable, steerable lawnmower comprising:

drivable, steerable platform structure including:

a frame member generally disposed in a frame member plane;

at least five wheel assemblies, each of said wheel assemblies having:

first support structure rotatably connected to said frame member such that said first support structure rotates about an axis substantially perpendicular to said frame member plane, said first support structure being endlessly rotatable through an angle of 360°;

a wheel member rotatably mounted on said first support structure such that said wheel member rotates in a wheel rotation plane about an axis substantially parallel to said frame member plane;

first drive structure to drive said wheel member about its axis of rotation in said wheel rotation plane; and

first steering structure to rotate said first support structure about its axis of rotation, whereby said wheel member is endlessly steerable through an angle of 360°;

a first endless device drivingly connected to each of said first drive structures to rotate each of said wheel members substantially in synchronism;

a second endless device drivingly connected to each of said first steering structures to rotate each of said first support structures substantially in synchronism; and

drive means for selectively driving said first and second endless devices, said means including:

a driving device;

first coupling structure to selectively couple and uncouple said driving device and said first endless device; and

second coupling structure to selectively couple and uncouple said driving device and said second endless device;

wherein the wheel rotation planes of said at least five wheel members are disposed substantially parallel to each other;

lawnmower structure including:

housing structure movingly connected to said platform structure; and

blade structure accommodated in said housing structure and disposed substantially parallel to said frame member plane, said blade structure being drivingly connected to said driving device; and

control structure including:

means for providing control signals;

means connected to receive said control signals for activating said driving device;

means connected to receive said control signals for providing steering control signals and driving control signals;

means connected to receive said steering control signals for selectively operating said second coupling structure of said drive means; and

means connected to receive said driving control signals for selectively operating said first coupling structure of said drive means.

4,463,822

CRUISE CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE

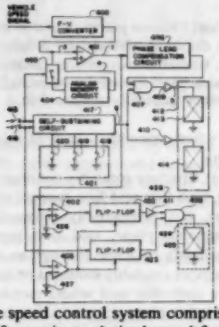
Kou Taniguwa, Akashi; Jiro Masuda, Kobe; Kazumasa Nakamura, Okazaki, and Kazuhiko Hayashi, Toyota, all of Japan, assignors to Fujitsu Ten Limited, Kobe and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed May 26, 1982, Ser. No. 382,413

Claims priority, application Japan, May 27, 1981, 56-80286; May 27, 1981, 56-80287; May 27, 1981, 56-80288

Int. Cl.³ B60K *31/00*

U.S. Cl. 180—177 **5 Claims**



1. A vehicle speed control system comprising

first means for setting a desired speed for said vehicle, for comparing the actual speed of said vehicle with said desired speed and for providing a corresponding output,

resume function means for providing a resume function including an actuator for automatically controlling the accelerator of said vehicle for returning the actual speed of the vehicle to said desired speed conjunction with said output of said first means said resume function means further including:

a resume function switch for selecting when the resume function is to be operated;

second means responsive to said output of said first means and to the operation of said resume function switch to determine when said actual speed is at least a first predetermined amount less than said desired speed when said resume function switch is operated, and to provide a corresponding output until said actual speed is within a second predetermined amount less than said desired speed, said first predetermined amount being greater than said second predetermined amount, and

shift means including a transmission for automatically shifting from a high gear to a lower gear and back to said high gear in correspondence to said output of said second means,

wherein said transmission is shifted from said lower gear back to said high gear when the actual speed of the vehicle is within said second predetermined amount of said desired speed.

4,463,823

POWER TRANSMISSION UNIT FOR A MOTORCYCLE

Masaharu Tsuboi, Sayama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

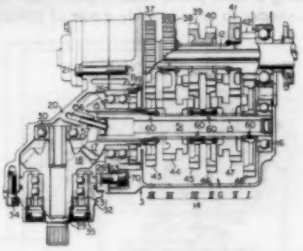
Filed Apr. 1, 1982, Ser. No. 364,460

Claims priority, application Japan, Apr. 2, 1981, 56-49843; Apr. 6, 1981, 56-51511

Int. Cl.³ B62M *11/10*

U.S. Cl. 180—226 **4 Claims**

1. A power transmission unit for a motorcycle having a body frame, the transmission unit comprising: a power unit case consisting of a crankcase and a transmission case for an engine mounted on the body frame, said crackcase and transmission case being integrated one with another; a bevel gear assembly; a countershaft in said transmission case; and a final shaft adapted to drive a rear wheel; said power unit case including a bevel gear case accommodating therein said bevel gear assembly, said bevel gear assembly including a driving bevel gear which is operatively connected with said countershaft in said transmission case, a driven bevel gear meshing with said driving bevel gear and operatively connected with said final shaft, and bearing means fitted in bearing holders which are fixedly secured to said bevel gear case by means of tightening bolts, said bearing means rotatably supporting said driving and



driven bevel gears in said bevel gear case, said driving bevel gear being splined fitted onto said countershaft as it is rotatably supported by said bearing means in the bearing holder therefor, whereby the bevel gear assembly is mounted on and can be dismounted from the power unit case with both the driving and driven bevel gears incorporated in the bevel gear assembly.

4,463,824

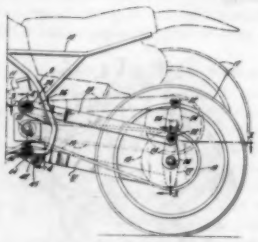
DRIVE WHEEL SUSPENSION SYSTEM FOR MOTORCYCLE

Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.

Continuation-in-part of Ser. No. 368,220, Apr. 14, 1982, Pat. No. 4,408,674. This application Sep. 7, 1982, Ser. No. 415,553

Int. Cl.³ B62K *25/04*

U.S. Cl. 180—227 **13 Claims**



8. In a motorcycle having a frame, an engine with a driving sprocket, a driven wheel having an axle structure with a coaxial sprocket chain driven from the driving sprocket, suspension mechanism for mounting the wheel on the frame of the motorcycle, the suspension mechanism including a pair of swing arms one located at each side of the wheel, and one located in a higher position than the other, pivots for mounting the forward ends of the swing arms on the frame, one pivot being located above the axis of the driving sprocket and the other being located below the axis of the driving sprocket, and linkage interconnecting the rear ends of the swing arms through the axle structure of the wheel, said linkage including a lever at each side of the wheel, the levers being torsionally interconnected through the axle structure and one lever extended upwardly from the axle structure and being pivotally connected with one of the swing arms at a distance corresponding to the distance of the frame pivot for that arm above the axis of the driving sprocket and the other lever extended downwardly from the axle structure and being connected with the other of the swing arms at a distance corresponding to the distance of

the frame pivot for that arm below the axis of the driving sprocket.

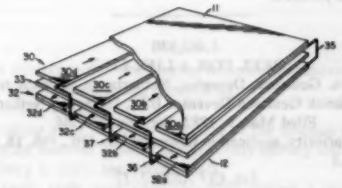
9. Mechanism as defined in claim 8 and further including means for adjusting the distance between the axis of the frame pivot and the axis of the lever pivot for at least one of the swing arms.

4,463,825

METHOD AND APPARATUS FOR GENERATION OF ACOUSTIC ENERGY

William E. Lerwill, Tulsa, Okla., assignor to James M. Bird, Tulsa, Okla.

Filed Jun. 28, 1982, Ser. No. 393,014
Claims priority, application United Kingdom, Jul. 3, 1981, 8120636
Int. Cl.³ G01V 1/157, 1/38
U.S. Cl. 181—113 19 Claims



1. In a method of imparting acoustic energy into a body of water, the steps comprising:

(a) disposing in the body of water a planar electroacoustic transducer comprising first and second transducer plates each having a conforming electrical conductive path and which are secured together in a juxtaposed position in which said conductive paths are spaced from one another in a close conforming relationship wherein the internal electrical resistance of said transducer is less than the motional impedance thereof as defined by the relationship:

$$Z_m = \frac{(I\mu o l)^2}{(2\pi r_e)2\rho cA}$$

wherein:

I is the amplitude of said current impulse in amps,

μo is the permeability of free space,

l is the common length of said current paths in meters,

r_e is the effective radial distance between said current paths in meters,

c is the velocity of sound in said water in meters/sec.,

ρ is the density of the water in kilograms per cubic meter,

A is the radiating area of said transducer in square meters, and

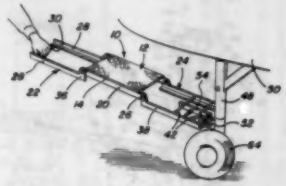
(b) providing an impulse of opposed current flow in adjacent portions of said conductive paths to produce an electromagnetic field between said conforming conductive paths and force said transducer plates apart to generate an acoustic impulse having a center-band frequency of less than 350 Hz and wave length which is less than twice the major planar axis of said transducer.

4,463,826

AIRPLANE TOW BAR AND STEP STOOL COMBINATION

Richard H. Pearce, 2127 S. Beaumont St., Moses Lake, Wash. 98837

Filed Aug. 23, 1982, Ser. No. 411,083
Int. Cl.³ B60D 1/00
U.S. Cl. 182—20 12 Claims



1. A combination airplane tow bar, seat, and step stool structure comprising a platform formed by a generally flat plate, a pair of leg assemblies, means pivotally connecting the leg assemblies to opposite peripheral portions of the platform for engagement of an upper end portion of each leg assembly with an undersurface of the platform when the leg assemblies are oriented in perpendicular depending relation to the platform so as to support the platform in elevated position for use as a seat or step stool, and for pivoting of the leg assemblies from said perpendicular relation to an overlying position to an upper surface of the platform to enable storage of the structure in a compact position, and means on one of said leg assemblies for connection with an airplane for use as a tow bar when the leg assemblies are pivoted to a position generally parallel to the platform and extending outwardly therefrom.

4,463,827

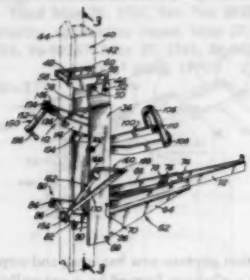
ADJUSTABLE HANDHOLD

Edward H. Sittner, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 2, 1982, Ser. No. 403,989
Int. Cl.³ E06C 9/04
U.S. Cl. 182—93 15 Claims

1. An adjustable handhold assembly comprising: a base handhold member including a first flange mounting portion and a longitudinally extending portion; said first flange portion spaced laterally from said longitudinally extending portion; the length of said longitudinal rod portion being sufficient to meet most distances between fasteners utilized on transportation vehicles; a second handhold member including a base portion having an opening and an outwardly extending second flange mounting portion aligned with said first flange portion; said opening slidingly receiving said rod portion and thereby enabling adjustment of the distance between the flange portions; whereby said rod portion may be cut to the desired length at the installation site; said rod portion being bent at its end portion adjacent said second flange portion.

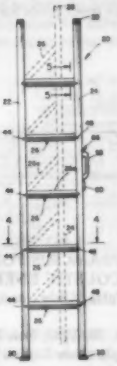
4,463,828
PUMP JACK
Carl Anderson, 12 St. Stephens Pl., Staten Island, N.Y. 10306
Filed Dec. 18, 1981, Ser. No. 332,015
Int. Cl.³ A63B *27/00*
U.S. Cl. 182—136 **13 Claims**



1. A pump jack arranged for travelling up and down a pole, comprising:
a frame member;
a lower shackle member supported on said frame member, having front and rear clamping bars for applying a coupling force for gripping the pole;
a pump arm pivotally coupled to said frame member;
an upper shackle member pivotally coupled to said pump arm, having a front helical rod and a rear clamping bar for applying a coupling force for gripping the pole;
biasing means responsive to the pumping action of the pump arm for alternately positioning one of said shackle members in gripping relationship with the pole;
said pump arm pivotally stepping upward said frame member during a pump stroke while said upper shackle member grips the pole and pivotally stepping upward said upper shackle member during a reverse stroke while said lower shackle member grips the pole;
release means for disengaging said lower shackle member from the pole, and
an over the center spring loaded handle means coupled to said helical rod for rolling the pump jack down the pole and for preventing downward rolling during the upward stepping action, wherein said handle means has a first position for cranking of said helical rod and a second position for locking of said helical rod.

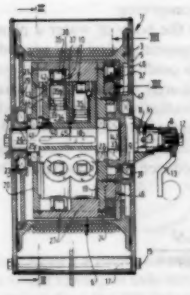
4,463,829
FOLDABLE LADDER
Arly Grin, 611 Argyle Rd., Brooklyn, N.Y. 11230
Filed Feb. 25, 1982, Ser. No. 352,318
Int. Cl.³ E06C *1/383*
U.S. Cl. 182—160 **13 Claims**

1. A self-storing foldable ladder comprising a pair of companion side rails, a plurality of transverse rung members mounted at spaced intervals between said rails, said rung members including an upper wall defining a tread surface, a bottom wall and two opposed side walls, said side walls having a longitudinal groove substantially coextensive with the rung, pivot means in one of said side rails, said pivot means including a pin extending from said rail with one end of each of said rung members being journalled about a respective pin, guide means in the other of said side rails, said guide means including a stud mounted to said rail, with a head of said stud being slidably received in each of said longitudinal grooves, said rungs being swingably displaceable about said pivot means as the side rails are moved into abutting contact, locking means mounted in one of said side rails, said locking means including a hooking latch member, said latch member being adapted for interfitting engagement with one of said rung members by insertion through an opening in the upper wall to stabilize the ladder when in an operational mode, further including a recess within the bottom wall of said rung, said recess being adapted for



interfitting engagement by the latch member when the side rails are in abutting contact to secure the side rails in a storage mode whereby the ladder may be carried in a substantially horizontal position.

4,463,830
REEL FOR A LIFE-LINE
Alfonsus A. Geurtsen, Deventer, Netherlands, assignor to Machinefabriek Geurtsen Deventer B.V., Deventer, Netherlands
Filed Mar. 9, 1982, Ser. No. 356,448
Claims priority, application European Pat. Off., Feb. 16, 1982, 82200182.2
Int. Cl.³ A62B *1/12*
U.S. Cl. 182—238 **6 Claims**



1. A reel for a life-line, a frame adapted to be secured to a support, a winding member rotatably supported by said frame about a fixed axis and capable of paying out a life-line as the winding member rotates about said axis, damping means acting between said frame and said winding member for controlling the rotational speed of the latter, said frame including a housing portion having a side-by-side pair of cylinder bores extending outwardly with respect to said axis to present blind inner ends and open outer ends, said bores being spaced apart to present a wall therebetween, piston means reciprocable in each bore, cam means rotatable with said winding member and surrounding said housing portion for urging one piston means inwardly into its bore while permitting the other piston means to be expelled outwardly into contact with said cam means, and a channel in said housing portion extending unidirectionally through that region of said wall of the housing portion

separating said blind inner ends of said bores so as to establish direct communication therebetween, said channel being of a predetermined cross sectional area to provide selected resistance to the flow of fluid pumped back and forth between those volumes of the bores beneath said piston means.

4,463,831

SPRING POWERED PRIME MOVER

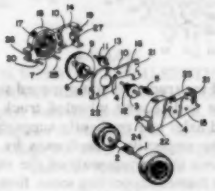
Hiroshi Wakase, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1982, Ser. No. 359,835

Claims priority, application Japan, Mar. 24, 1981, 56-41046[U]

Int. Cl.³ F03G *1/08*; A63H *17/00, 29/04*

U.S. Cl. 185—39 **11 Claims**



1. A miniature improved spring wound prime mover capable of use in toys and the like comprising:

a housing member;

an output shaft rotatably mounted to the housing member;

a spring member capable of selectively storing and releasing enery to drive the output shaft;

a plastic resin gear train assembly having a plurality of molded gears connected to the spring member and the output shaft and capable of providing a first and a second gear ratio depending on the specific gears that are engaged, the first gear ratio including gears with molded carbon fibers to provide a higher degree of mechanical strength than those engaged in the second gear ratio, the first gear ratio being engaged for moving the spring member for storing energy and to be automatically forced out of engagement when the spring member drives the output shaft and a second gear ratio automatically forced into engagement when the spring member drives the output shaft and automatically forced out of engagement when the gear train assembly is driven by an external force for moving the spring member to store energy.

4,463,832

INDUSTRIAL TRUCK

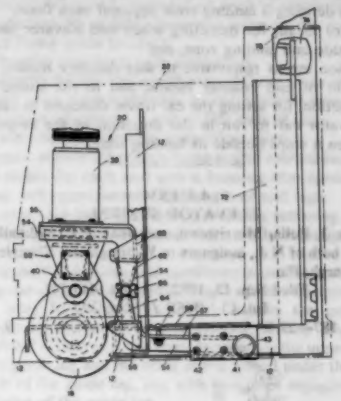
Edward F. Bens, Jr., Lexington, Ky., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Apr. 8, 1982, Ser. No. 366,621

Int. Cl.³ B66B *9/20*

U.S. Cl. 187—9 R **13 Claims**

1. In a lift truck having a rigid frame supported adjacent one end by wheel means, an upright assembly mounted on the frame and a drive unit adjacent the other end of the lift truck pivotally mounted on said frame, opposed first connector means mounted on said frame and on said drive unit adapted to be operably connected to each other by an adjustable connector member which is adapted to effect by adjusting the pivotal relation between said frame and drive unit first and second predetermined adjustment positions of said upright, and said adjustable connector member consists of a second connector means located intermediate said pivotal connection and said opposed first connector means and adapted to secure together as a single rigidly connected unit said drive unit and frame at



either of said first or second adjustment positions of said upright.

4,463,833

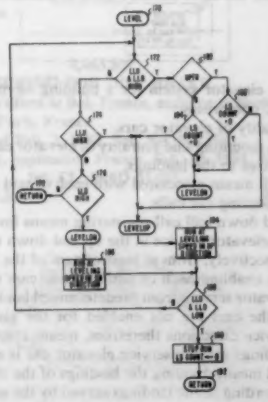
ELEVATOR SYSTEM

Richard H. Ludwig, West Caldwell; Linus R. Dirnberger, Randolph, and Alan L. Husson, Hackettstown, all of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 19, 1982, Ser. No. 409,687

Int. Cl.³ B66B *3/02*

U.S. Cl. 187—29 R **7 Claims**



1. An elevator system, comprising:

a building having a plurality of floors,

an elevator car mounted for movement in the building to serve said floors, said elevator car having an advanced position while moving which corresponds to the closest floor ahead at which it can make a normal stop,

means storing the travel direction of the run,

means providing a first signal, with said first signal being an advanced car position signal which is only provided each time the advanced car position changes from one floor to another floor during a run,

means providing a second signal, with said second signal being a floor level signal which is only provided each time the elevator car is level with a floor during the run,

counter means responsive to said first and second signals, with said counter means being incremented by the first signals and decremented by the second signals,

means defining a landing zone adjacent each floor,

detector means for detecting when said elevator car stops outside said landing zone, and

direction means responsive to said detector means, to the count of said counter means, and to the stored travel direction, for setting the car travel direction to cause the elevator car to run in the direction of the target floor when it stops outside its landing zone.

4,463,834

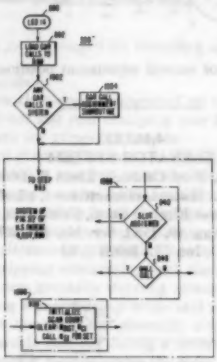
ELEVATOR SYSTEM

Marjorie J. Polis, Morristown, and Joanne E. Mikhail, Budd Lake, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 13, 1982, Ser. No. 417,741

Int. Cl.³ B66B *1/18, 1/20*

U.S. Cl. 187—29 R **9 Claims**



1. An elevator system for a building having a plurality of landings, comprising:

a plurality of elevator cars,

means mounting said plurality of elevator cars for movement relative to the landings,

car call means associated with each of said elevator cars for registering car calls,

up and down hall call registering means for registering calls for elevator service in the up and down travel directions, respectively, from at least certain of the landings,

means enabling each of said elevator cars to serve calls for elevator service from predetermined landings such that all of the cars are not enabled for the same landings and service directions therefrom, means responsive to which landings each in-service elevator car is enabled to serve, said means dividing the landings of the structure into sets according to the landings served by the same combination of cars,

first assignment means which assigns unassigned service directions ahead of each car associated with floors at which each car will stop due to registered car calls, said first assignment means assigning said service directions in a first priority arrangement which makes assignments without regard to the sets which such assignments may belong,

and second assignment means effectively assigning calls for elevator service registered on the hall call registering means to the elevator cars by assigning unassigned service directions from the landings to the cars in a second priority arrangement based at least in part upon the sets of landings, and service directions therefrom, served by the same combination of elevator cars.

4,463,835

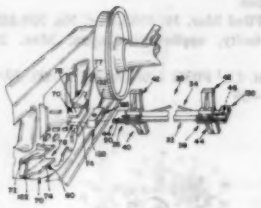
SLIDE BEARING ATTACHMENT FOR U-SECTION TYPE UNIT BRAKE BEAM GUIDE LUGS

Richard F. Murphy, Batavia, and Michael K. Murphy, Aurora, both of Ill., assignors to Holland Co., Aurora, Ill.

Filed Sep. 13, 1982, Ser. No. 416,849

Int. Cl.³ B61H *13/00*

U.S. Cl. 188—52 **20 Claims**



1. In a railroad car truck including spaced side frames riding on a pair of first and second wheeled truck axles, a bolster intermediate said axles and resiliently supported at either end of same from the respective side frames by a spring group interposed between the spring seats of the respective bolster ends and the side frames supporting same, first and second unit brake beams disposed one on either side of the bolster, with the first brake beam having brake heads adjacent each end of same each equipped with a brake shoe for braking application to the wheels of the first truck axle, and with the second brake beam having brake heads adjacent each end of same each equipped with a brake shoe for braking application to the wheels of the second truck axle, said brake beams each having guide lugs at their respective ends, with the side frames on their in board sides defining for the first brake beam a first pair of opposed guide brackets each defining a guide slot lying on a radius of the first truck axle in which said first brake beam guide lugs are respectively mounted for movement along said first truck axle radius in a plane that includes said first brake beam guide slots, and with the side frames on the in board sides defining for the second brake beam a pair of opposed guide brackets each defining a guide slot lying on a radius of the second truck axle in which said second brake beam guide lugs are respectively mounted for movement along said second truck axle in a plane that includes said second brake beam guide slots, said guide lugs each being of U-shaped section defining a web portion that faces the respective side frames and upper and lower side flanges projecting from said web portion for connection to the brake beam main beam, and power means for moving the respective brake beams along the respective slots to seat the respective brake shoes against the respective truck wheels to apply the truck brakes,

the improvement wherein:

a bearing structure is mounted on each of said brake beam guide lugs for slidably mounting same in the respective side frame guide brackets,

said bearing structures each comprising:

a box-like body formed from a polymer material of dry self lubricating characteristics,

said body being planar and rectilinear in outline and of U-shaped transverse cross section configuration along the length thereof defining a web portion and spaced apart parallel side walls projecting from said web portion in superposed relation,

said body side walls being spaced apart to closely receive the guide lug mounted therein,

with said body side walls being joined together at either ends of same by opposed integral end walls that form the forward and rearward ends of the respective bearing structures,

said body receiving the guide lug it is mounted on between said side walls thereof with one side wall on the upper side

of the guide lug and the body other side wall at the lower side of the guide lug,

said body side walls each recess mounting means for securing said bodies to the respective guide lug flanges,

said bodies being respectively slidably received within the respective side frame guide slots to mount said brake beams, respectively, for said movement of same along the respective guide slots under the action of said power means,

said bodies being proportioned at the outer surfacings of said sidewalls thereof for substantially complemental fit of the respective bodies within the respective guide slots for maintaining said brake beams, respectively, in substantial coplanar relation with the axle radius of the guide bracket guide slots in which the respective brake beams are mounted,

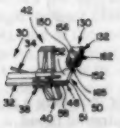
whereby on actuation of said power means the brake beam shoes are presented in flush relation with the respective truck wheels.

4,463,836

SNAP-ON SLIDE BEARING FOR U-SECTION TYPE UNIT BRAKE BEAM GUIDE LUGS

Richard F. Murphy, Batavia, and Michael K. Murphy, Aurora, both of Ill., assignors to Holland Co., Aurora, Ill.

Filed Sep. 30, 1982, Ser. No. 429,276
Int. Cl.³ B61H *13/00*
U.S. Cl. 188—52 **20 Claims**



1. In a railroad car truck including spaced side frames riding on a pair of first and second wheeled truck axles, a bolster intermediate said axles and resiliently supported at either end of same from the respective side frames by a spring group interposed between the spring seats of the respective bolster ends and the side frames supporting same, first and second unit brake beams disposed one on either side of the bolster, with the first brake beam having brake heads adjacent each end of same each equipped with a brake shoe for braking application to the wheels of the first truck axle, and with the second brake beam having brake heads adjacent each end of same each equipped with a brake shoe for braking application to the wheels of the second truck axle, said brake beams each having guide lugs at their respective ends, with the side frames on their in board sides defining for the first brake beam a first pair of opposed guide brackets each defining a guide slot lying on a radius of the first truck axle in which said first brake beam guide lugs are respectively mounted for movement along said first truck axle radius in a plane that includes said first brake beam guide slots, and with the side frames on the in board sides defining for the second brake beam a pair of opposed guide brackets each defining a guide slot lying on a radius of the second truck axle in which said second brake beam guide lugs are respectively mounted for movement along said second truck axle in a plane that includes said second brake beam guide slots, said guide lugs each being of U-shaped section defining a web portion that faces the respective side frames and upper and lower side flanges projecting from said web portion for connection to the brake beam main beam, and power means for moving the respective brake beams along the respective slots to seat the respective brake shoes against the respective truck wheels to apply the truck brakes,

the improvement wherein:

a bearing structure is mounted on each of said brake beam guide lugs for slidably mounting same in the respective side frame guide brackets,

said bearing structures each comprising:

a resiliently flexible clip member comprising a pair of spaced apart arms joined together in one piece U-shaped construction relation by a web at like ends of same,

said arms being of film thickness dimensions,

said arms at their other ends being angled toward each other to define for each said arm a locating stop spaced from said web approximately the length of said lugs,

said arms each having affixed to the outer surfacing of same a strip of a polymer material of dry self lubricating characteristics,

said strips being planar and rectilinear in outline and extending the major portion of the length of the respective arms,

said arms being spaced apart to receive the guide lug mounted therein in snap fit relation thereto lengthwise thereof with one of said arms disposed on the upper side of the guide lug and the other arm disposed under the lower side of the guide lug, and with said stops engaging a side edging of the guide lug,

said bearing structures being respectively slidably received within the respective side frame guide slots to mount said brake beams, respectively, for said movement of same along the respective guide slots under the action of said power means,

said strips being proportioned for substantially complemental fit of the respective bearing structures within the respective guide slots for maintaining said brake beams, respectively, in substantial coplanar relation with the axle radius of the guide bracket guide slots in which the respective brake beams are mounted,

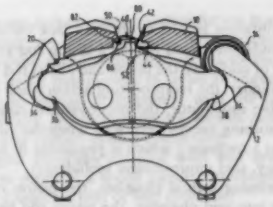
whereby on actuation of said power means the brake beam shoes are presented in flush relation with the respective truck wheels.

4,463,837

SPRING FOR DISC BRAKE

Pierre Courbot, Villiers le Bel, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Feb. 3, 1982, Ser. No. 345,175
Claims priority, application France, Feb. 19, 1981, 81 03268
Int. Cl.³ F16D *65/02*
U.S. Cl. 188—73.38 **9 Claims**



1. A spring (40) for a disc brake of the type comprising a caliper (10) mounted slidingly parallel to the axis of a rotating disc (30) on a fixed support (12) by means of at least two axial sliding surfaces (16, 18) formed on the caliper (10) and on the fixed support and maintained elastically in contact, and two friction members (22, 24) with respective supporting plates (26, 28) received in anchorage and for axial sliding motion in an opening (34) in said fixed support for frictional engagment with the opposed faces of said disc upon actuation of a brake motor (32), said spring being mounted in an opening (50) of an arch of the caliper and exerting on the supporting plates of said friction

members of radial force (R) directed approximately along a radius of the disc (30) and a tangential force (T) perpendicular to said radial force (R) to urge each of the friction members (22, 24) tangentially to the circumference of said disc to ensure maintaining of the friction members (22, 24) in a preferential lateral position, characterized in that the spring (40) comprises a bent metal leaf having two main arms (42, 44) connected by a central bend (52), said spring (40) exhibiting in section the shape of a "V" of which the branches consist of said main arms (42, 44), the arms cooperating with two approximately planar surfaces (46, 48) formed on the caliper (10) and extending parallel to the axis of the disc (30), said planar surfaces (46, 48) forming between them an angle (β) greater than an angle (α) formed by said main arms, said central bend (52) cooperating with a bearing surface (63) formed on each of said supporting plates (26, 28) of the friction members (22, 24) to exert on the friction members an elastic force (F) composed of said radial force (R) and said tangential force (T), said bearing surface (63) constituted by an angle of support (63) provided on a lug (56) disposed on an upper part of each of said supporting plates (26, 28), the angle of support including an upper face (62) of the respective support plate and with said central bend (52) being supported in said angle of support (63).

4,463,838

VIBRATION JACKS

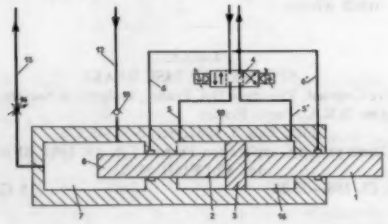
Jean-Louis Jacottet, Elevage moderne de Crotteau, France, assignor to Etablissements Paul Jacottet, Versailles, France

Continuation of Ser. No. 159,764, Jun. 16, 1980, abandoned. This application Aug. 16, 1982, Ser. No. 408,140

Claims priority, application France, Jun. 18, 1979, 79 15483

Int. Cl.³ F16F 9/18

U.S. Cl. 188—299 **7 Claims**



1. In a vibration jack, the vibration jack including a piston with two ends, the piston having a piston rod extending from at least one of said ends, the piston and piston rod reciprocating within a cylinder, the reciprocating action being controlled by a servo-valve distributor, the improvement comprising a device for absorbing energy generated when the vibration jack is operating at a frequency which is proximate to its characteristic frequency, said improvement including:

means defining a fluid chamber, the piston rod extending axially into said chamber, the piston rod having a cross-sectional area smaller than that of said fluid chamber;

means defining a pair of fluid flow passages which communicate with one of said passages being a fluid supply duct and the other of said passages being a fluid discharge duct;

throttle means disposed in said fluid discharge duct, fluid being discharged from said chamber only through said throttle means and only when the piston rod is moved in a first direction; and

means disposed in said fluid supply duct for delivering fluid to said chamber via the supply duct and only when the piston rod moves in a second direction opposite to the first direction.

4,463,839

HYDRAULIC DAMPER

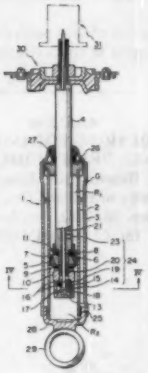
Masahiro Ashiba, Kanagawa, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Nov. 4, 1982, Ser. No. 439,718

Claims priority, application Japan, Nov. 6, 1981, 56-165530[U]; Nov. 12, 1981, 56-168790[U]

Int. Cl.³ F16F 9/34

U.S. Cl. 188—299 **3 Claims**



1. A hydraulic damper including a generally vertical cylinder receiving therein hydraulic liquid, a piston working in the cylinder and partitioning the interior thereof into two liquid chambers, one or a pair of damping force generating valves mounted on the piston for generating the damping force both in the extension and contraction strokes of the damper, a piston rod secured to the piston and extending through the upper end of the cylinder to the outside, a coaxial bore and a radial hole formed in the piston rod to constitute a by-pass passage connecting said two liquid chambers, an adjustable valve member for steppingly controlling the effective area of the by-pass passage, and an actuating rod extending through said coaxial bore in the piston rod with the inner end thereof being secured to said valve member, characterized by

a guide member having a bore coaxial with the actuating rod and being mounted on the upper end of the piston rod,

a rotor rotatably disposed in said bore in the guide member and being normally biassed upward by a spring and associated with the actuating rod,

saw-teeth like projections and recesses formed on the upper end of the rotor and being spaced with each other along the circumference thereof,

at least one fixed guide projecting in said bore in the guide member for normally engaging with either one of the recesses thereby restricting the upward movement and the rotation of said rotor,

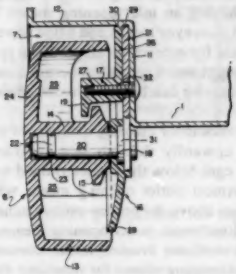
a vertically displaceable guide guided by said fixed guide and having on the lower end thereof at lease one projection for engaging with either one of said saw-teeth shaped projections on the rotor, whereby said rotor rotates by one tooth of said saw-teeth shaped projections in response to each reciprocal movement of said displaceable guide, and

an electromagnetic solenoid connected to said displaceable guide.

4,463,840
WHEELED SUITCASE

André G. Seynhaeve, Senlis, France, assignor to Societe Delsey, Bobigny, France

Filed Feb. 18, 1983, Ser. No. 467,515
Claims priority, application France, Feb. 24, 1982, 82 03046
Int. Cl.³ A45C 5/14; B60B 33/00
U.S. Cl. 190—18 A 8 Claims

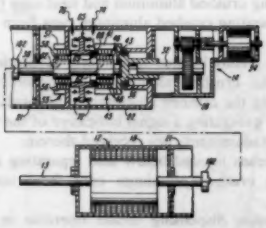


1. A suitcase comprising two shells and at least two wheels disposed in housings provided in the external face of at least one shell, so as to project outwardly, characterized in that each wheel (6) comprises a cylindrical running strip (13) integral with a central hub (14) having an external annular rib (15), a support (16) comprising studs (17) spaced at equal distances from a bore (18) coaxial with the hub and each ending in a radial lug (19) under which the rib (15) of the hub fits, and a shaft (20) passing through the bore (18) of the support to penetrate inside the hub (14), one of the ends of this shaft carrying a plate (21) applied against the face of the support (16) which is opposite the studs (17) whereas its other end comprises an annular groove (22) cooperating with a complementary annular rib (23) formed inside the hub, means (32) being provided for securing the plate (21) and the support (16) inside the housing (7) provided in the external face of the corresponding shell (1).

4,463,841
MULTIPLE SPEED DRIVE SYSTEM

Reginald D. Kelley, Fairfield, Ohio, assignor to Force Control Industries, Inc., Fairfield, Ohio

Filed Jul. 17, 1981, Ser. No. 284,479
Int. Cl.³ B60K 41/28; F16H 37/06
U.S. Cl. 192—18 A 8 Claims

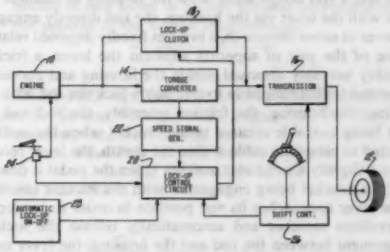


1. A drive system for producing high speed starting and stopping of a motor shaft at differential speeds, comprising a first electric motor including a motor housing rotatably supporting a motor shaft having opposite first and second end portions, said second end portion being the output of said drive system, an oil shear clutch-brake unit including a housing adapted to contain a supply of oil, said unit further including an input drive member and an output drive member supported for rotation on a common axis, means including a series of interfitting clutch plates and discs within said clutch-brake unit housing and arranged for selectively coupling said input drive member to said output drive member, means including a series of interfitting brake plates and discs within said clutch-brake unit housing and arranged for selectively braking said output drive member relatively to said housing, actuating means including a non-rotating piston supported within said housing and movable axially between a clutch engaging position clamping said clutch plates and discs together and a brake engaging position clamping said brake plates and discs together and through a neutral position, means for circulating oil within said housing outwardly between said clutch plates and discs and said brake plates and discs, means connecting said output drive member of said clutch-brake unit to said first end portion of said shaft of said first electric motor, a second electric motor having a motor housing rotatably supporting a motor shaft, a gear reducer connecting said motor shaft of said second electric motor to said input drive member of said clutch-brake unit for driving said motor shaft of said first electric motor with said second electric motor at a speed slower than the speed of said first electric motor when said actuating means is in said clutch engaging position, and means for holding said actuating means in said neutral position and for moving said piston to either said clutch engaging position or said brake engaging position from said neutral position.

4,463,842
LOCKUP CONTROL SYSTEM FOR TORQUE CONVERTER

Gilbert E. Redzinski, Niles, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Dec. 16, 1981, Ser. No. 331,053
Int. Cl.³ B60K 41/28; F16H 45/02
U.S. Cl. 192—0.052 11 Claims



1. An automatic lockup control system for use in a vehicle of the type having an engine coupled with traction wheels through a driveline, said driveline including a torque converter and a change-speed transmission in series arrangement and a lockup clutch in parallel arrangement with the torque converter, said lockup clutch including a lockup actuator, said automatic lockup control system comprising:

a speed signal generator coupled with said driveline and adapted to produce a speed signal corresponding to the speed of a selected part of said driveline,

said lockup actuator being adapted to selectively engage and disengage the lockup clutch in response to lockup and unlock signals respectively,

lockup signal means including signal comparing means and being coupled between the speed signal generator and the lockup actuator and being adapted to produce a lockup signal when the value of the speed signal exceeds a reference value and to produce an unlock signal when the value of the speed signal is less than said reference value,

reference signal means coupled with the lockup signal means for supplying a reference signal thereto and including switching means for changing the reference signal be-

tween a first predetermined value and a second predetermined value when the switching means is actuated,

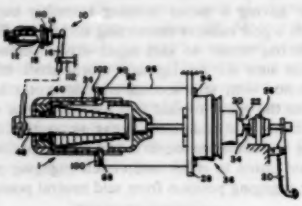
and torque demand responsive means coupled with said reference signal means for actuating said switching means in response to a change in the torque demand on said engine.

4,463,843

CABLE ASSEMBLY

Alistair G. Taig, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Apr. 2, 1981, Ser. No. 250,497
Int. Cl.³ F16D *13/75*
U.S. Cl. 192—111 A **3 Claims**



1. An automatic adjuster for a cable assembly extending from a pedal to a lever, the pedal being pivotally actuated to control movement of the lever, the lever cooperating with a clutch member which is wearable to define a slight variation for the rest position of the lever in response to wear of the clutch member, the cable assembly including a sheath extending between a pair of supports and substantially enclosing the cable therein, the cable assembly further including a housing coupled to the cable remote from the pedal and adjacent the lever and a rod cooperating with the housing to connect the cable with the lever via the housing, the rod directly engaging the lever to move therewith, a bracket fixedly disposed relative to one of the pair of supports adjacent the lever, a friction assembly movably disposed within the housing and cooperating with a resilient member to releasably lock the rod with the housing, the housing, the friction assembly, the rod and the lever being movable relative to the bracket when the pedal is actuated to move the cable within the sheath, the lever returning to a slightly altered rest position when the pedal is deactuated, the bracket being engageable with the friction assembly as the lever approaches its rest position in order to overcome the resilient member and automatically release the locking engagement between the rod and the housing, the lever moving the rod relative to the friction assembly and housing as the lever returns to the slightly altered rest position, the friction assembly cooperating with the resilient member to reestablish a locking engagement with the rod and housing when the lever reaches its new rest position, bracket comprising a U-shaped member with a first leg connected to the one of the pair of supports, a longitudinal body extending from the first leg in the direction of the lever to a second leg, and the housing being movable from a rest position wherein the friction assembly engages the second leg to a position substantially between the first and second legs to separate the friction assembly from the second leg.

4,463,844

APPARATUS AND METHOD FOR RETURN OF EMPTY ALUMINUM CANS

Stanley S. Huffman, Golden; Jan L. Dorfman, Littleton; Robert L. Frenkel, Englewood, and Ronald A. Pearce, Lakewood, all of Colo., assignors to Adolph Coors Company, Golden, Colo.

Filed Dec. 23, 1981, Ser. No. 333,639
Int. Cl.³ G07F *7/06*
U.S. Cl. 194—4 C **39 Claims**

1. Apparatus for receiving aluminum and steel cans and dispensing compensation for at least the aluminum cans comprising:

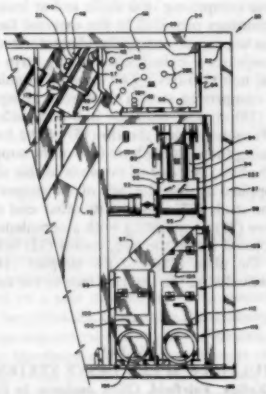
inlet hopper means for receiving a quantity of cans;

upwardly inclined conveyor means for receiving the quantity of cans and carrying the cans upwardly to a first discharge area;

air duct means mounted in an upwardly inclined position beneath and in juxtaposition to the upper portions of said conveyor means for receiving all cans from said conveyor means and having an inlet opening means located next adjacent said conveyor means and a first lowermost outlet opening means for receiving cans above a predetermined minimum weight and a second uppermost outlet opening means for receiving can below a predetermined minimum weight;

pressurized air means for creating a stream of high pressure air flowing upwardly through said air duct means for carrying the cans below the predetermined weight to said second uppermost outlet opening means while enabling passage of cans above the predetermined minimum weight to said first lowermost outlet opening means;

aluminum and steel can crusher means connected to said second outlet opening means for receiving aluminum and



steel cans from said air duct means and for crushing aluminum and steel cans therein;

separating means located below said crusher means for receiving crushed aluminum and steel cans therefrom and for separating crushed aluminum cans from crushed steel cans;

weighing means located below said separating means for receiving crushed aluminum cans therefrom and for weighing the crushed aluminum cans received therefrom and for generating a signal indicative of the weight of the crushed aluminum cans received therein;

hopper means located below said separating means for receiving crushed aluminum cans from said separating means;

compensation dispensing means operable in response to generation of said signal for dispensing compensation for the total weight of crushed aluminum cans;

all of said aforementioned means being mounted in a relatively small process module;

a relatively large size storage module means being attached to one side of said process module for storage of crushed aluminum cans; and

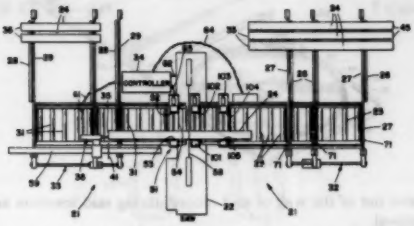
transport means for transporting crushed aluminum cans from said hopper means to said storage module means.

4,463,845

MATERIAL-HANDLING APPARATUS AND METHOD

Gerald R. Harris, P.O. Box 1148, Pryor, Okla. 74361

Filed Sep. 24, 1981, Ser. No. 305,207
Int. Cl.³ B65G *43/08, 43/10, 47/22*
U.S. Cl. 198—341 16 Claims



1. A material-handling apparatus for rapid and precision feeding of material, such as bar stock, plate stock and the like, into a predetermined registered position with respect to a machine tool, said material-handling apparatus including material conveyor means formed for support of said material thereon and formed for powered advancement of said material at a relatively high speed toward said registered position, stop means formed and positioned to terminate high speed powered advancement of said material in advance of said registered postion, and low speed advancement means formed to advance said material toward said registered position at a relatively low speed, said stop means being further formed to terminate the low speed advancement of said material at approximately said registered position, wherein the improvement in said material-handling apparatus is comprised of:

said low speed advancement means is provided by movable inching vise means formed to selectively positively grip and to advance said material while gripped from a position in advance of and proximate said registered position toward said registered position at said low speed; and

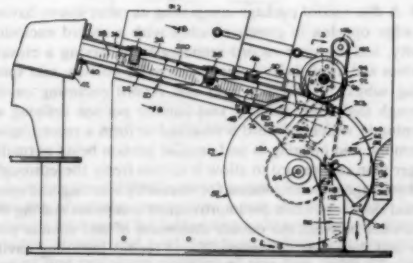
said stop means being further formed and coupled to sense the presence of said material at said registered position and to terminate advancement of said material by said inching vise means upon sensing thereof in said registered position.

4,463,846

BOTTLE ORIENTING APPARATUS

Alexandru D. Ionescu, Fairfield, Conn., assignor to New England Machinery, Inc., South Norwalk, Conn.

Filed Apr. 23, 1979, Ser. No. 32,111
Int. Cl.³ B65G *47/24*
U.S. Cl. 198—399 15 Claims



1. Bottle orienting apparatus comprising:

(a) guide means for receiving and sequentially advancing in random first-end leading and first-end trailing dispositions a series of bottles, each of which has a first end, a second end of different configuration than its first end, a lengthwise axis extending between its ends, and a lateral axis adjacent to its first end;

(b) transport means for sequentially receiving each bottle advanced by said guide means, pivotably engaging a pair of portions of each such bottle when portions lie on the lateral axis of such bottle, and transporting each such bottle, while such portions are so engaged, away from said guide means so that the engaged portions of each such bottle move with substantially equal, predetermined velocities generally perpendicular to the lateral axis of such bottle;

(c) booster means for sequentially frictionally engaging a third portion of each such bottle remote from the lateral axis of such bottle and, during the transportation of such bottle by said transport means, urging such third portion to move with a velocity of the same direction but of greater magnitude than said predetermined velocities, whereby each such bottle will tend to pivot about the lateral axis thereof;

(d) stop means for preventing the pivoting, about the lateral axis thereof, during its engagement by said booster means, of any bottle which is in first-end leading disposition at the beginning of such engagement but permitting such pivoting of any bottle which is in first-end trailing disposition at the beginning of such engagement, whereby any bottle which is advanced by said guide means in first-end leading disposition will retain such disposition during its transportation by said transport means, but any bottle which is advanced by said guide means in first-end trailing disposition will be pivoted toward a first-end leading disposition during such transportation; and

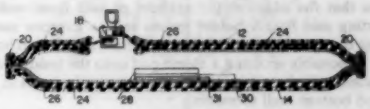
(e) takeoff means for sequentially removing from said transport means each bottle transported thereby, the guide means, transport means and takeoff means being so constructed and arranged that the sequential order of the bottles in said series of bottles remains unchanged during the passage of the bottles therethrough.

4,463,847

RUST-PREVENTIVE FIREARMS RECEPTACLE

Stuart P. Gordon, Raleigh, N.C., assignor to The Bob Allen Companies, Inc., Des Moines, Iowa

Filed Feb. 1, 1983, Ser. No. 435,084
Int. Cl.³ B65D *81/24, 85/00*
U.S. Cl. 206—205 2 Claims



1. a rust-preventive firearm receptacle comprising:

a water-vapor-impervious material cover defining a cavity,

a vapor-phase antirust inhibitor insert with active vapor-phase antirust inhibitor,

a soft interior, including means attached to said interior for replaceably receiving said vapor-phase antirust inhibitor insert, and

closure means for sealably closing said cover over a firearm within said cavity.

4,463,848

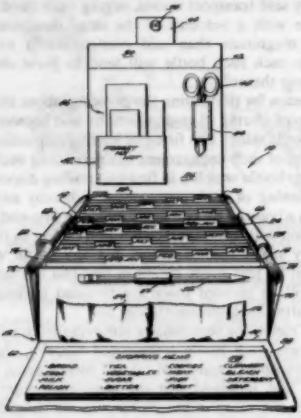
COUPON SECRETARY

Elizabeth Parker, 281 Canada St., Lake George, N.Y. 12845

Filed Jun. 19, 1979, Ser. No. 49,901
Int. Cl.³ A45C *11/34*
U.S. Cl. 206—214 6 Claims

1. A portable coupon case for storing and organizing dis-

count coupons and other shopping supplies and for use with shopping carts to allow the case to be taken to the store comprising first case means defined by top, bottom, front, back and opposing side walls for holding and arranging coupons, said top being hingedly secured to said first case means so as to be movable between open and closed positions, said first case means being divided into at least two inner compartments for separating current year and following year coupons, divider means for separately defining month by month sections within each of said at least two inner compartments so that coupons can be arranged according to their expiration dates, first pocket means secured to the exterior of said back wall for holding items relatively larger than coupons, second and third pocket means, respectively attached to said opposing side walls for holding and separating specialty coupons, said second



and third pocket means including closure flaps for closing said pocket means, said first case means further including first holder means for holding coupons to be used immediately, second holder means for holding scissors, third holder means for holding a writing instrument, fourth holder means for holding a memo pad, and closure means for securely holding top in a closed position, said first case means further including a separate front panel hingedly attached thereto along the bottom edge of said front wall, said panel having an inside wall portion that fits adjacent the exterior of said front wall for supporting said fourth holder means and an exterior surface forming the exterior of said first case means, said fourth holder means removably securing a memo pad onto the inside wall of said panel, and wherein said first pocket means includes at least side and bottom wall members.

4,463,849

VIDEO DISC CADDY

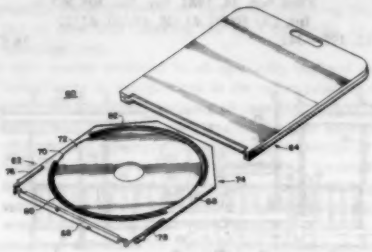
John J. Prusak, and Bhupendra P. Patel, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed May 23, 1983, Ser. No. 497,341

Int. Cl.[3] B65D *85/57*; G11B *5/82, 25/04*

U.S. Cl. 206—307 **4 Claims**

1. In a disc record package including a record retaining spine removably housed in an outer sleeve; said record retaining spine having a leading closure portion and a trailing annular portion; said trailing annular portion having an opening in which a record is received to form a record/spine assembly; the interior surfaces of said outer sleeve defining an edge opening in communication with a record enclosing cavity in which record/spine assembly is received; said record/spine assembly being subject to insertion into said sleeve, and removal therefrom, through said edge opening; wherein the improvement comprises providing each side of the spine with wiping pads around said record receiving opening in said trailing annular portion for pushing the debris on said interior surfaces of said



sleeve out of the way of said record during said insertion and removal.

4,463,850

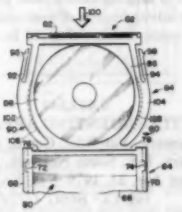
VIDEO DISC CADDY

Istvan Gorog, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 10, 1983, Ser. No. 493,193

Int. Cl.[3] B65D *85/57*; G11B *5/82*

U.S. Cl. 206—309 **5 Claims**

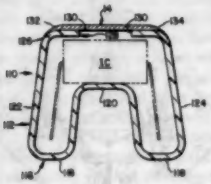


1. A disc record package comprising an outer sleeve having an edge opening in communication with a record enclosing cavity, and an inner record retaining spine having a closure portion and a relatively compliant annular portion; said spine being subject to insertion into said record enclosing cavity through said edge opening; said annular portion defining an opening in which a record is received to form a record/spine assembly; said opening in said annular portion being normally larger than said record to allow it to pass freely therethrough; said package including means for releasably securing said spine to said sleeve; wherein the improvement comprises making the difference between the outside dimension of said annular portion and the inside dimension of said record enclosing cavity greater than the corresponding difference between the inner walls of said annular portion defining said opening therein and the outer periphery of said record to produce an interference between said spine and said record as said record/spine assembly is inserted into said sleeve, so that said record is held in place during insertion.

4,463,851
PROTECTIVE ENCLOSURE FOR ELECTRONIC DEVICES

Waldo E. Cecil, Irving, Tex., assignor to Meritex Plastic Inc., Arlington, Tex.

Continuation of Ser. No. 371,738, Apr. 26, 1982, abandoned.
This application Jul. 25, 1983, Ser. No. 516,437
Int. Cl.³ B65D *85/42, 65/18;* H05F *3/02*
U.S. Cl. 206—328 7 Claims

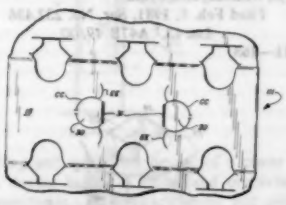


1. A protective enclosure for electronic devices comprising:
an elongate tube formed from a rigid conductive thermoplastic material and comprising a bottom wall, side walls extending upwardly from the bottom wall, and a top wall including portions extending inwardly from each of the side walls;
the top wall of the tube being characterized by a gap defined by spaced apart edges extending the entire length of the tube; and
a layer of transparent rigid thermoplastic material mounted on the outer surface of the top wall of the tube and extending across the gap formed therein creating double thickness top wall sections for reinforcing a portion of the top wall of the tube adjacent the gap and extending laterally outwardly toward the side walls while permitting observation of electronic devices enclosed within the tube through the gap and central portion of the transparent layer of thermoplastic material.

4,463,852
ARTICLE CARRIER

James L. Stone, Wyoming, Mich., assignor to Packaging Corporation of America, Evanston, Ill.

Continuation of Ser. No. 206,011, Nov. 12, 1980, abandoned.
This application Feb. 24, 1983, Ser. No. 469,203
Int. Cl.³ B65D *5/36, 5/46*
U.S. Cl. 206—427 4 Claims

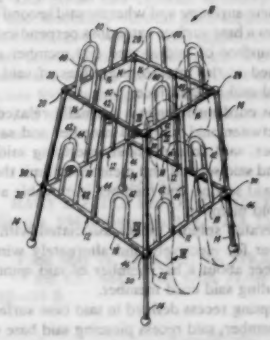


1. A carrier of foldable sheet material for accommodating a plurality of articles arranged in a pair of parallel rows, comprising a base panel for subtending and supporting the rows of articles; upright end wall panels extending from oppositely spaced first peripheral portions of said base panel for disposition adjacent opposite ends of the article rows; upright side wall panels extending from oppositely spaced second peripheral portions of said base panel, each side wall panel adapted to be disposed adjacent a side of an article row; and a handle spanning the distance between the end wall panels, said handle including an elongated single ply center section foldably connected at opposite ends to upper portions of said end wall panels and a pair of elongated side sections foldably connected to opposite elongated side edges of said center section, and, when in one folded mode, extending downwardly and having portions thereof adapted to be disposed between the article rows, said center section being provided with a pair of longitudinally spaced fingerholes, the portion of said center section intermediate said fingerholes being substantially planar and in spaced substantially parallel relation with said base panel, even when the side sections are in the folded mode, said sheet material having a grain extending longitudinally of said center section, each fingerhole having a tab adapted to be struck out from said center section and folded relative thereto in a direction towards said base panel and under the portion of said center section intermediate said fingerholes, said tabs initially extending in opposite directions away from each other, each tab being substantially defined by a substantially continuous curved cut having opposite end portions curved outwardly away from each other and forming a pair of relatively spaced open loops, the open sides of each pair of loops of a cut facing substantially in a direction towards an adjacent end wall panel, the open loops of each cut being disposed at opposite ends of the folding axis of the tab defined by said cut, said tab having a maximum width portion spaced from the folding axis thereof which is greater than the length of the folding axis between said loops, said maximum width being measured in a direction parallel to said folding axis.

4,463,853
RACK FOR FOOTWEAR

Vito Licari, and Yaffa Licari, both of Elberon, N.J., assignors to Basic Line, Inc., Cliffwood Beach, N.J.

Filed Jul. 7, 1981, Ser. No. 281,035
Int. Cl.³ A47F *7/08*
U.S. Cl. 211—37 33 Claims



1. A plastic rack for footwear, comprising an open-ended framework having a plurality of substantially identical sides arranged to give said framework a truncated pyramidal shape, each of said sides comprising a frame member consisting of a unitary, homogenous molded structure, at least two of said frame members each including at least one upright leg member, a plurality of cross members extending laterally therefrom and hanging means extending upwardly from at least one of said cross members for hanging footwear interiorally and exteriorally of said framework around substantially the entire periphery thereof, said hanging means lying wholly within planes defined by said sides of said framework so that said hanging means do not extend laterally inwardly or outwardly from said framework, whereby said rack may be stacked on top of and over another rack identical thereto, and connecting means on said leg members and on said cross members, respectively, for

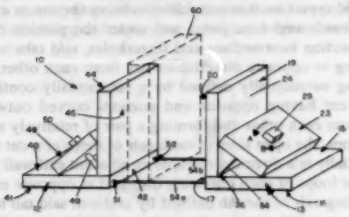
connecting one of said frame members to adjacent frame members.

4,463,854

BOOK SUPPORT ASSEMBLY

David D. MacKenzie, 350 Carpenter Dr., Apt. 820, Atlanta, Ga. 30328

Filed Jan. 17, 1983, Ser. No. 458,204
Int. Cl.[3] A47B 65/00
U.S. Cl. 211—43 7 Claims



1. Apparatus for supporting books or like articles; comprising:

first end member including an abutment surface for supportably abutting such article, base surface extending perpendicular to said abutment surface and a butt edge defined at the intersecting edges of said abutment surface and said base surface;

second end member including an abutment surface normally disposed in opposed relation to said abutment surface of said first member for supportably abutting articles therebetween, said second end member being movable relative to said first end member for adjusting the spacing between said abutment surfaces; and wherein said second end member includes a base surface extending perpendicular to said abutment surface of said second end member and a butt edge defined at the intersecting edges of said abutment surface and said base surface;

at least a first cord member in a normally relaxed state extending between said first end member and said second end member, said cord member intertying said first end member and said second end member to limit the distance to which said second end member is movable away from said first end member;

manually operated spindle means associated with said first end member for electively and alternately winding said cord member about a bar member of said spindle means and unwinding said cord member,

a dowel accepting recess defined in said base surface of said first end member, said recess piercing said base surface at an acute angle;

a dowel accepting recess defined in said base surface of said second end member, said recess piercing said base surface at an acute angle; and

a dowel comprising a first end removably inserted into said dowel accepting recess of said first end member and a second end removably inserted into said dowel accepting recess of said second end member,

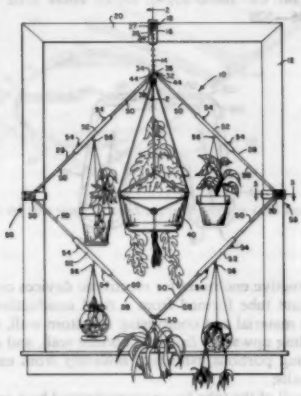
whereby said butt edges of said first and second end members are in near abutment and said abutment surfaces of said first and second end members define an obtuse angle therebetween when said dowel is in place with both said ends of said dowel inserted in the respective dowel accepting recesses thus defining a lectern type book support, and whereby winding of said cord member to a point of tension in said cord member maintains said dowel in place.

4,463,855

PLANT HANGER FRAME

James F. Smithers, 63 Varnum St., Haverhill, Mass. 01838

Filed Oct. 30, 1981, Ser. No. 316,883
Int. Cl.[3] A47F 5/08, 5/13
U.S. Cl. 211—71 5 Claims



1. A plant hanger framework comprising four elongated members,

means pivotally interconnecting said elongated members end to end to form a plurality of corners and a diamond trapezoid shape,

means for hanging a plant from each elongated member, means for securing at least two corners of said framework to a window frame, and means for adjusting the length of each of said elongated members,

said framework being adjustable to fit within the periphery of window frames of different sizes,

a bracket means to suspend said framework from the top of a window frame,

said bracket means including a bracket adapted to be secured to a window frame and means interconnecting said bracket with said elongated members.

4,463,856

THEFT-PREVENTIVE JEWELRY DISPLAY STAND

Andy Strasser, Carlstadt, N.J., assignor to General Mills Products Corp., Minneapolis, Minn.

Filed Feb. 8, 1981, Ser. No. 232,436
Int. Cl.[3] A47B 49/00
U.S. Cl. 211—163 5 Claims

1. An improved jewelry display stand useful in preventing theft comprising a flat, horizontally disposed bottom piece; a

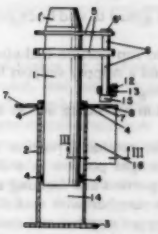
plurality of substantially vertical, rectangular side panels of substantially equal height mounted on and secured to said bottom piece; each of said side panels connected to an adjacent side panel; said side panels being of equal width so that said display stand has a hexagonal cross-section and at least one of said side panels is a mirror side panel; at least one of said side panels being a display side panel having a plurality of substantially vertical display arms extending perpendicularly from said display panel; a lid which is hexagonal and has affixed thereon a handle and is of sufficient area and shape to cover the tops of said display arms; each of said display arms having at least one vertically oriented slot, said vertically oriented slots in said display arms adjacent to each other facing and opposing each other so that jewelry display cards on which earrings and the like are mounted can be slidably mounted between and held by said display arms when said lid is detached from said jewelry display stand, but cannot be removed therefrom when said lid is attached; wherein said adjacent side panels are connected to each other by substantially vertical display panel rails, said panel rails having vertical slots therein conformed so as to receive said vertical edges of said adjacent panels so that said panels are held at an angle of 120° to each other; each of said panel rails having equal length interiorly attached vertical rail tubes shorter than said panel rails, a top piece received upon said rail tubes, said rail tubes being formed to receive rods passing through apertures in said top piece, said rail tubes and said bottom piece; said rods being of such length and being threaded at each end so as to receive nuts to fix said rods in position and thereby to provide support for said side panels.

4,463,857

LIFTING AND SWIVELLING DEVICE

Enrico Borinelli, Eggenwil, and Karl Bühler, Nussbaumen, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Oct. 2, 1979, Ser. No. 81,129
Int. Cl.³ C10B *25/14*
U.S. Cl. 212—166 **8 Claims**



1. In a lifting and swivelling device of a cover of an arc furnace, the device having a lifting and revolving column rotatably supported in a guide arrangement, said column being movable vertically and being provided with a swivelling mechanism arranged tangentially, the improvement comprising:

a downwardly pointing bar mounted to the revolving column with an axis parallel to that of the revolving column; and

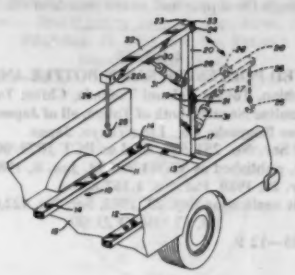
a fixed plate connected to the guide arrangement of the revolving column, said fixed plate extending at least in the swivelling area of the bar and having, at the position of the location of the bar in the working position of the furnace, a bore through which the bar passes.

4,463,858

REVERSIBLE PORTABLE HOIST

Michael Bilas, 2730 Columbiana-New Castle Rd., New Springfield, Ohio 44443

Filed May 28, 1982, Ser. No. 382,967
Int. Cl.³ B66C *23/26*
U.S. Cl. 212—176 **3 Claims**



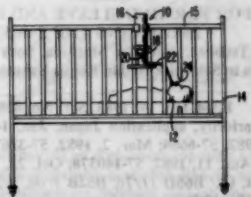
1. An improvement in a portable hoist mountable in a pickup truck and having a U-shaped frame, the improvement comprising a main vertical hoist support member with a secondary vertical hoist support member telescopically positioned therein, spaced upstanding apertured tabs on said main vertical hoist support member and a pin and clip assembly engaging said main vertical hoist support member and said secondary vertical hoist support member pivotally securing the same within said main vertical hoist support member, so as to pivot said secondary vertical hoist support member to a horizontal position, a boom and means pivotally securing said boom to said secondary vertical hoist support member, a piston and cylinder assembly, pairs of spaced apertured tabs positioned on said main vertical hoist support member and said secondary vertical hoist support member and said boom for selectively positioning said piston and cylinder assembly between said boom and said secondary vertical hoist support member and between said secondary vertical hoist support member and said main vertical hoist support member, a source of fluid pressure for said piston and cylinder assembly, a cable and hook assembly and means for attaching said cable and hook assembly to said boom and alternately to said secondary vertical hoist support member.

4,463,859

BABY BOTTLE FEEDING SYSTEM

Vibert F. Greene, 19400 Sorenson Ave. #213, Cupertino, Calif. 95014

Filed May 18, 1982, Ser. No. 379,395
Int. Cl.³ A61J *9/00, 9/06, 11/04*
U.S. Cl. 215—11 R **16 Claims**



1. A baby bottle feeding system comprising: a bottle having an open top; an adapter in the open top of the bottle and having a fluid flow passage therethrough, there being a resilient flow regulator in the adapter and a strain reducer element adjacent to the flow regulator to control elongation and deformation of the flow regulator, said flow regulator normally closing the

passage and being responsive to a suction force to open said passage to allow fluid flow therethrough; means coupled with said adapter for releasably securing the same to the bottle; a resilient nipple coupled to the adapter and adapted to be inserted into the mouth of a baby to be fed, whereby a baby sucking on the nipple will cause the passage through the adapter to be opened to permit the flow of fluid from the bottle, through the nipple and to the mouth of the baby.

4,463,860

SATURATED POLYESTER RESIN BOTTLE AND STAND

Yataro Yoshino, Tokyo; Takami Tsukada, Chiba; Tadao Saito, and Takamitsu Nozawa, both of Tokyo, all of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Division of Ser. No. 251,530, filed as PCT JP79/00162, Jun. 22, 1979, published as WO81/00009, Jan. 8, 1981, §102(e) date Mar. 20, 1980, Pat. No. 4,367,820.

This application Sep. 23, 1982, Ser. No. 422,060

Int. Cl.³ B65D *23/00*

U.S. Cl. 215—12 R **3 Claims**

1. In combination: a bottle and a stand; the bottle comprising a body portion and a bottom portion, the body portion having at its upper end an opening and connecting at its lower end to the bottom portion, the bottom portion being hemispherical in shape and of smaller diameter than the body portion so as to define a step where the bottom portion meets the body portion; the stand comprising a circumferential outer wall and a circumferential inner wall, the outer wall being at its upper edge of at least equal diameter to the body portion, the outer wall including a plurality of vertically extending ribs formed on the inner surface thereof and extending upwardly from the lower edge of the outer wall to a level where the ribs touch the bottom portion of the bottle, the inner wall receiving the bottom portion of the bottle and being radially inwardly spaced from the outer wall and merging therewith to define an annular surface therebetween.

4,463,861

SHEET FOR FORMING SLEEVE AND PROCESS FOR PRODUCING THE SAME

Masahiro Tsubone, and Bon Machida, both of Koga, Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed Jan. 14, 1983, Ser. No. 458,135

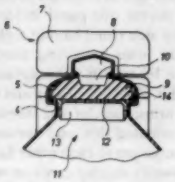
Claims priority, application Japan, Jan. 14, 1982, 57-4294; Jan. 18, 1982, 57-6664; Mar. 2, 1982, 57-33678; Mar. 9, 1982, 57-37542; Aug. 11, 1982, 57-140378; Oct. 22, 1982, 57-186399

Int. Cl.³ B65D *11/16;* **B32B** *1/08, 3/26, 27/06*

U.S. Cl. 215—12 R **13 Claims**

9. A laminate comprising a sheet having a more highly shrinkable foamed film and a lesser shrinkable non-foamed film, said films comprising polystyrene, said foamed film having a skin surface thicker on its side opposite that laminated to said non-foamed film;

said laminated sheet having a flow-direction shrinkage rate of 60% or less and a widthwise shrinkage rate of 10% or less, said flow-direction shrinkage rate being greater than said widthwise shrinkage rate.



10. The laminate as described in claim **9** further comprising a glass bottle wherein the flow direction edges of said sheet are bonded together so as to form a sleeve enclosing said bottle.

4,463,862

THERMOPLASTIC CONTAINER

Gerhard Hansen, Heerstrasse 20, 7166 Sulzbach-Laufen, Fed. Rep. of Germany

Filed Sep. 21, 1982, Ser. No. 420,915

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1981, 3139084

Int. Cl.³ A61M *5/14*

U.S. Cl. 215—33 **12 Claims**

1. A thermoplastic container, such as a bottle, comprising

a body portion;

a unitary top portion joined to said body portion by a unitary neck portion; and

stopper means in said top portion including an elastomeric stopper member and a stopper support body, said stopper support body having

a diaphragm portion extending across said neck portion; and

a generally tubular retaining portion extending axially from said diaphragm portion in a direction opposite from said body portion and forming a chamber receiving said stopper member with said diaphragm portion between said stopper member and container contents in said body portion, said retaining portion having a distal edge tapering to a thin edge to facilitate welding to said top portion of the container.

4,463,863

CLOSURE INCLUDING AN IMPROVED LINER

Noriyuki Imagawa, Ishioka, and Nobu Utsunomiya, Hiratsuka, both of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Dec. 10, 1980, Ser. No. 214,975

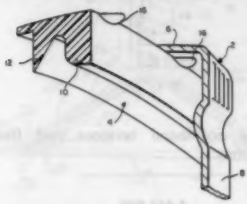
Claims priority, application Japan, Dec. 19, 1979, 54-164026

Int. Cl.³ B65D *53/04*

U.S. Cl. 215—343 **1 Claim**

1. A closure including a metal shell having a circular top surface, a substantially cylindrical skirt depending from the peripheral edge of the top surface, and a synthetic resin circu-

lar liner press formed on the inside top surface of the shell with the liner having at least one concentric annular projection adapted to seal with a container opening where the diameter of the circular liner is less than the diameter of the circular top surface whereby a radially extending space is formed between



an outer edge of the projection and an inside surface of said skirt; the improvement comprising in having a plurality of thin projecting tabs circumferentially spaced about the circumference of said liner with each tab having a length extending radially outwardly of said annular projection in said space.

4,463,864

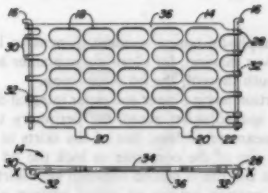
BASKET FOR RETAINING PARTS DURING HEAT TREATMENT

Maurice P. Roach, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Sep. 30, 1982, Ser. No. 430,189

Int. Cl.³ C21D *9/00*; F27D *1/00*; B65D *6/24*

U.S. Cl. 220—4 F **4 Claims**



1. An improved basket for retaining parts on a tray as said parts are heat treated, said basket including a plurality of side members attached together by removable connecting pins, wherein said improvement comprises:

(a) side members of rectangular configuration each having first and second surfaces with a plurality of openings formed therethrough, each side member having distally spaced projections extending downward from a bottom edge, said projections engaging openings formed in said tray, and each of said side members having a first thickness which tapers along the length of both said first and second surfaces in a gradual symmetrical fashion to a narrow dimension located approximately halfway between said ends, with the change in thickness resulting in a more uniform thermal gradient and hence in the occurrence of reduced thermal stresses being imparted across each of said side members; and

(b) a plurality of fingers arranged in a generally horizontal plane and projecting outward from opposite ends of said side members in a vertically offset arrangement, each of said fingers having a bore formed therethrough such that said bores at each end are coaxially aligned, said bores at each end receiving one of said connecting pins once said fingers of one side member are interleaved with said fingers of a second side member so as to retain said bottom edges of each of said side members in a single horizontal plane.

4,463,865

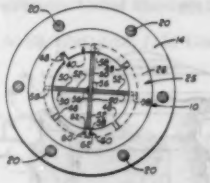
KNIFE BLADE APPARATUS FOR SEVERING RUPTURE DISKS

Arnold L. Mundt, and Gloan Nguyen, both of Tulsa, Okla., assignors to BS&B Safety Systems, Inc., Tulsa, Okla.

Filed Sep. 23, 1983, Ser. No. 535,152

Int. Cl.³ F16K *17/40*

U.S. Cl. 220—89 A **15 Claims**



1. An improved knife blade apparatus adapted to be installed in a rupture disk assembly whereby upon failure of the rupture disk in the assembly, the disk is severed by the knife blade apparatus comprising:

an annular support member adapted to be installed in said rupture disk assembly, said support member including an annular groove and at least two spaced-apart longitudinal grooves intersecting said annular groove disposed interiorly therein;

knife blade means disposed interiorly of said support member, said knife blade means including exterior portions which extend into said grooves in said support member whereby said exterior portion can be moved by way of said longitudinal grooves into said annular groove and then within said annular groove to positions away from said longitudinal grooves to thereby removably attach said knife blade means to said support member; and

removable retaining means attached to said support member for retaining said exterior portions of said knife blade means in said positions in said annular groove away from said longitudinal grooves.

4,463,866

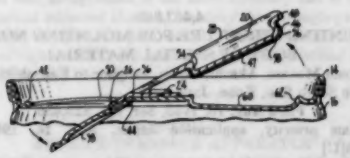
CONTAMINATION PROTECTION MEMBER FOR OPENING AND RESEALING DEVICE

George Mandel, 62 Long View Ct., Danville, Calif. 94526

Filed Mar. 11, 1983, Ser. No. 474,726

Int. Cl.³ B65D *41/32*, *17/34*

U.S. Cl. 220—269 **4 Claims**



1. In a container having an aluminium top with a pivotal tap opening mechanism engaging a scored flap in said top for forming a contents dispensing aperture, said tab opening mechanism including a resealing stopper member thereon, for hermetically resealing said aperture when said stopper member is pivoted over said aperture and pressed into said aperture, the improvement comprising:

a storage recess incorporated on said container top engageable with said stopper member, said storage recess having a peripheral edge and said stopper member having a seal-

ing lip which contacts said peripheral edge and protects said edge and the underside of said stopper member from contaminants when said stopper member is nestled in said recess.

4,463,867

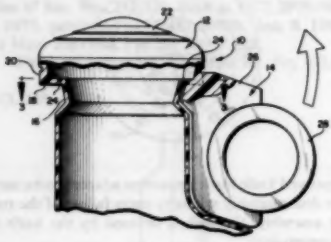
PLASTIC CONTAINER WITH EASILY REMOVABLE, INTEGRALLY FORMED CAP

Dieter H. Nagel, Elk Grove Village, Ill., assignor to Heinz Plastic Mold Co., Elk Grove Village, Ill.

Filed Aug. 19, 1983, Ser. No. 524,659

Int. Cl.³ B65D *17/34*

U.S. Cl. 220—270 **10 Claims**



1. A thermoplastic container which is blown, filled and hermetically sealed in a single forming and filling operation and which has a removable cap integrally formed therewith, said container comprising a neck portion,

said removable cap normally hermetically sealing said container and having

a peripheral side wall,

a horizontally extending flange portion which merges with said neck portion, and

a first annular groove formed in said horizontally extending flange portion and providing a weakened severing line for removing said cap,

a pull tab having

a narrow in width, vertically disposed tab flange integrally connected with said horizontally extending flange portion and extending from adjacent said first annular groove outward toward said peripheral side wall, and

means for gripping said pull tab to pivotally manipulate said pull tab outwardly from said container,

said pull tab on being pivotally manipulated causing said horizontally extending flange portion to sever at said first annular groove, thereby permitting said cap to be removed from said container.

4,463,868

MOUNTING STRUCTURE FOR MOUNTING NOZZLE BODY OF SPECIAL MATERIAL

Noriyoshi Murase, Akashi, Japan, assignor to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Aug. 16, 1983, Ser. No. 523,436

Claims priority, application Japan, Aug. 16, 1982, 57-123906[U]

Int. Cl.³ B65D *41/04*

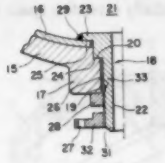
U.S. Cl. 220—288 **5 Claims**

1. A mounting structure for mounting a cylindrical nozzle body on a pressure vessel body having an internal lining wherein said cylindrical nozzle body is made of a material which cannot be welded to said pressure vessel body, said nozzle body comprising:

a flanged portion at a leading end positioned within said pressure vessel;

a stepped portion for abutment against a seating surface of said pressure vessel body; and

a threaded portion at an end opposite said leading end for securing said nozzle body to said vessel, said stepped



portion being positioned between said flanged and threaded portions.

4,463,869

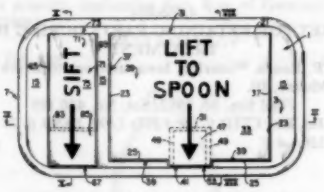
TAMPER-EVIDENT SPICE CAN LID

Duane H. Lewis, Claysville, Pa., assignor to Continental Plastics, Inc., Washington, Pa.

Filed Aug. 4, 1983, Ser. No. 520,508

Int. Cl.³ B65D *39/00*

U.S. Cl. 220—307 **12 Claims**



1. A thermoplastic tamper-evident dispensing lid having a resealable cover thereon, for closing a container having a rim about the mouth thereof, the lid comprising:

a top wall portion having inner and outer integral downwardly depending spaced skirts about the periphery thereof, and engaging means on at least one of the skirts to frictionally engage the rim of the container to lock the lid to the container when the rim is placed between said skirts;

the top wall portion having an upper surface and a recess therein forming rear, side and front walls about the recess, and a dispensing aperture within the recessed portion;

a resealable cover integrally hinged adjacent the rear wall of said recess, the top surface of the cover being no higher than the upper surface of top wall portion of the lid when the cover is in closed position;

a depending locking lip on the cover engageable with a wall of the aperture in the recess to lock the cover in closed position and seal the aperture;

the cover having a flap at the front portion thereof, the flap being integrally hinged, at the rear portion thereof with the cover and frangibly secured, along the side portions thereof, with the cover; and

a gap in the front wall of said recess, adjacent said flap, providing access to said flap when the cover is in closed position.

4,463,870

CLOSURE PLATE FOR AN OPENING

John A. Coburn, Jr., Warren, and Paul R. Shaw, Richmond, both of Mich., assignors to L & L Products, Inc., Romeo, Mich.

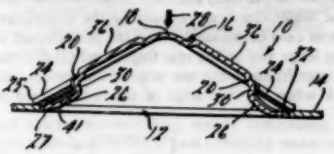
Filed Oct. 19, 1983, Ser. No. 543,400

Int. Cl.³ B65D *39/00*

U.S. Cl. 220—307 **41 Claims**

1. A closure device for at least partially covering or closing an aperture in a panel structure or the like, said closure device comprising a relatively stiff but malleable one-piece body

including a number of integral outer attachment members, at least a portion of each of said outer attachment members loosely and abuttingly engaging a portion of said panel structure generally adjacent said aperture and supporting the remainder of said closure device in a generally arched configuration spaced apart from said aperture when said closure device is inserted into said aperture from a first side of said panel structure, said closure device being adapted to receive a force



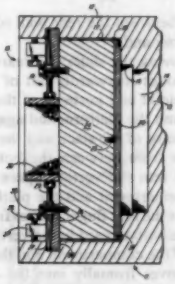
exerted thereon in a direction generally toward said aperture, at least a portion of said closure device deforming toward said aperture and said outer members moving outwardly into a relatively tight gripping relationship with said portions of said panel structure generally adjacent said aperture in response to said force, said one-piece body thereby at least partially closing said aperture and being relatively securely attached to said panel structure.

4,463,871

CLOSURE SEAL FOR HIGH PRESSURE VESSEL

Philip P. Garbarini, Jersey City, and Renato R. Noe, Union City, both of N.J., assignors to Public Service Electric and Gas Company, Newark, N.J.

Filed Aug. 3, 1983, Ser. No. 519,857
Int. Cl.³ B65D *53/00*
U.S. Cl. 220—378 **18 Claims**



1. Sealing apparatus for a pressure vessel that includes a hollow body member adapted to contain fluid at high temperature and high pressure, said body member having an access opening including an inner portion, an outer portion, and an annular shoulder between the inner portion and the outer portion, the diameter of the outer portion being larger than the diameter of the inner portion, a sealing member having a peripheral region that includes a circumferential outer surface and an annular surface, means for holding the annular surface of the sealing member in abutment with the annular shoulder of the access opening, and means for sealing between the sealing member and the access opening, wherein said sealing means comprises

an annular groove formed in the peripheral region of the sealing member, the groove having a base surface, an inner sidewall on the high pressure side of the groove, and an outer sidewall on the low pressure side of the groove, at least the outer sidewall having a concave curvature in cross section; and

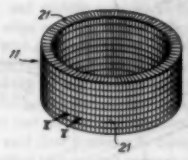
an O-ring of perfluorolatomeric material disposed in the groove, the diameter of the cross section of the O-ring being greater than the depth of the groove, such that the O-ring is in sealing contact with an inner surface of the body member opposite the groove when the sealing member is fitted within the access opening in abutment with said annular shoulder.

4,463,872

PRESSURE VESSELS

John M. Yellowlees, Cheshire, England, assignor to National Nuclear Corporation Limited, England

Filed Feb. 10, 1982, Ser. No. 347,642
Claims priority, application United Kingdom, Feb. 13, 1981, 8104632
Int. Cl.³ B65D *90/08;* **E04C** *1/08, 1/16;* **G21C** *13/02*
U.S. Cl. 220—428 **14 Claims**



1. A pressure-vessel wall component, in the form of a truncated wedge-shaped slab of cast iron having an inner end, an outer end, upper and lower faces and two mutually opposed wedge faces each extending between the inner end and the outer end and between upper and lowe faces in respective planes which are inclined at an angle to one another and intersect in a line, wherein the slab is formed with cast-in through-passages which are arranged in layers at progressively spaced distances from the said line, the through-passages in each layer extending, at a common distance from the said line and parallel with one another, obliquely in a direction from one of said planes to the other and from the lower to the upper face, the obliquity of direction being reversed in successive layers of said component whereby the through-passages extend obliquely left- and right-handedly with respect to said line in alternate layers of such passages at progressively spaced distances from said line.

5. A pressure-vessel wall structure of generally cylindrical form, composed of wall components as claimed in claim 1, wherein a plurality of such components are assembled together with their said wedge faces in abutment to form an annular assembly and a plurality of such assemblies are stacked coaxially with one another to form the said wall structure, and wherein the through-passages of each wall component are in register with and in alignment with the through-passages of adjacent wall components in the same assembly and in assemblies stacked adjacent thereto, whereby the through-passages of the wall components provide in the assembled structure a system of right-handed and left-handed generally helical stressing tendon ducts therefor.

4,463,873

ARTICLE TRANSFER APPARATUS

Katsuhiro Fukuyama, Miura; Masatoshi Haruta, Fukuoka, and Takashi Takahashi, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

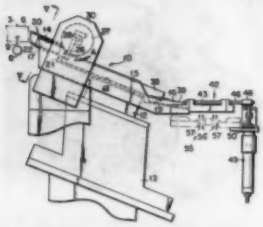
Filed Mar. 11, 1982, Ser. No. 357,084
Claims priority, application Japan, Mar. 18, 1981, 56-39234
Int. Cl.³ B65G *43/08*
U.S. Cl. 221—12 **18 Claims**

1. An article transfer apparatus for continuously sequentially receiving a number of identical articles held in a feeding unit and for transferring each of the articles to an article assembling station with a feeding mechanism, comprising:

a starting station having a receiving end and a delivery end, which is connected to said feeding unit at said receiving end thereof, and sequentially receiving the articles from said feeding unit;

shutter means operative to selectively open said delivery end of said starting station, upon which the article is fed from said delivery end of said starting station, the shutter means having a plate member which is rockably mounted about an axis, said plate member being located substantially vertically in a closing position to close said delivery end, and said plate member rocking along the feeding direction of the article to be separated from said delivery end when said plate member moves to an opening position;

chute means connected to said delivery end of said starting station and slanted so that the article fed from said starting



station upon the opening operation of said shutter means rolls down therealong;

hopper means adapted to open and close freely and located close to said feeding mechanism of said article assembling station so as to receive the article rolled down by said chute means and to temporarily retain the article, the article within said hopper means being transferred to said feeding mechanism of said article assembling station when said hopper means is opened;

hopper actuating means for opening or closing said hopper means;

detecting means for detecting a presence or absence of the article in said hopper means and for generating a detection signal corresponding thereto; and

means for opening said shutter means in response to the detection signal representing the absence of the article.

4,463,874

VENDING MACHINE HAVING CARD MOVING FINGERS

Evelyn Friedman, Whitehall; Martin A. Borho, Ticonderoga; William R. Carswell, Whitehall, all of N.Y., and Frank Kecseti, Winston Salem, N.C., assignors to E B Metal Industries Inc., Whitehall, N.Y.

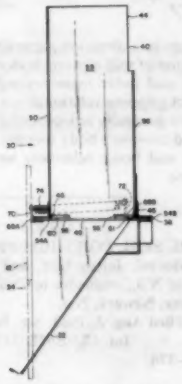
Filed May 18, 1982, Ser. No. 379,305
Int. Cl.[3] B65H *1/06*
U.S. Cl. 221—238 **14 Claims**

1. A card dispenser, comprising:

(a) a compartment for a vertical stack of horizontally disposed cards; the compartment having an open bottom through which the cards can move downwardly;

(b) a horizontal platform, below the compartment, having an opening, below the open bottom of the compartment, through which the cards can move downwardly from the compartment; a horizontal ledge being provided in the front of the opening, extending rearwardly, and a horizontal ledge being provided in the rear of the opening, extending frontally; the front and rear ledges being adapted to underlie simultaneously the stack of cards in the compartment; the lateral end portions of the bottom of the front wall of the compartment being vertically spaced above the top of the platform; and the bottom of the rear wall of the compartment being vertically spaced above the top of the platform by at least the vertical thickness of one of the cards;

(c) a slider, located on the platform on one lateral side of the compartment and adapted to move rearwardly and frontally along the platform; the slider having a pair of laterally extending, front and rear fingers, spaced farther apart than the front and rear edges of each of the cards; the fingers having a vertical thickness no greater than one of the cards; the fingers being adapted to move horizontally between the platform and the compartment so that: (1) the front finger can urge rearwardly the front edge of the bottom card of the stack when the bottom card is on the front ledge and on the rear finger; and (2) the rear finger can urge frontally the rear edge of the bottom card of the stack when the rear edge of the bottom card is in the



vertical space between the rear wall of the compartment and the platform; and

(d) means for moving the slider: (1) rearwardly so that the front finger moves rearwardly out of the vertical space between the lateral end portions of the front wall of the compartment and the platform and against the front edge of the bottom card of the stack and the rear finger moves rearwardly out from between the bottom card and the rear ledge and into the vertical space between the rear wall of the compartment and the platform; and then (2) frontally so that the rear finger moves frontally against the rear edge of the bottom card in the vertical space between the rear wall of the compartment and the platform and the front finger moves frontally into the vertical space between the lateral end portions of the front wall of the compartment and the platform.

4,463,875

METHOD AND APPARATUS FOR PREPARING AND APPLYING A TWO-COMPONENT CEMENT

Slobodan Tepic, Zagreb, Yugoslavia, assignor to Robert W. Mann, Cambridge, Mass. and Thomas Macirowski, Brooklyn, N.Y., a part interest to each

Filed Jun. 14, 1982, Ser. No. 388,401
Int. Cl.[3] B67B *7/24;* **B67D** *5/52*
U.S. Cl. 222—82 **21 Claims**

4. Apparatus for preparing and applying a two-component cement, each component being vacuum-packed in an elongated flexible fluid-tight compartment, said apparatus comprising

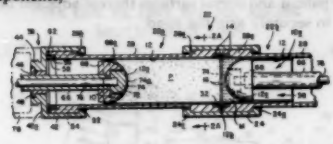
A. means for confining the compartments in abutting relation so that their longitudinal axes are collinear;

B. means for establishing a seal around the abutting portions of said compartments;

C. means for gradually collapsing one compartment to force

its contents to brak through said abutting portions into the other compartment;

D. means for controlling the extension of said other compartment as it receives said one compartment contents so as to enhance the intimacy of the contact between said components;



E. said extension-controlling means comprising plunger means slidably mounted to said confining means and movable in the direction of said axes so as to engage and retard the extension of said other compartment.

4,463,876

MEASURING DEVICE

Sven A. Swallert, Geneva, Switzerland, assignor to NPI New Products Investment AB, Askim, Sweden

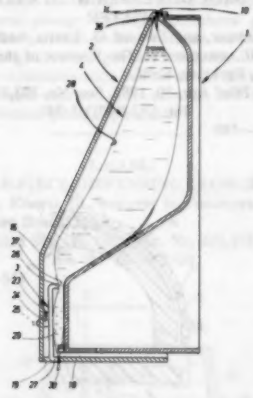
PCT No. PCT/SE81/00014, 371 Date Sep. 21, 1981, 102(e) Date Sep. 21, 1981, PCT Pub. No. WO81/02094, PCT Pub. Date Aug. 6, 1981

PCT Filed Jan. 23, 1981, Ser. No. 305,640

Claims priority, application Sweden, Jan. 24, 1980, 8000562

Int. Cl.³ G01F *11/02*

U.S. Cl. 222—94 **3 Claims**



1. A measuring device for dispensing liquids, preferably viscous liquids, comprising: a collapsible container made of a generally soft material for the liquid, said container including a main space and a measuring chamber being of smaller volume than and being arranged below said main space, a first passage providing communication between said main space and said measuring chamber, and a second passage extending from said measuring chamber; a resilient movable member having a first position compressing a portion of the container which includes said second passage while keeping the container substantially uninfluenced at a portion which includes said measuring chamber and said first passage, a second position compressing a portion of the container which includes said first passage with continued substantial compression of said second passage while keeping a portion of said container which includes said measuring chamber substantially uninfluenced, and a third position compressing a portion of said container which includes said measuring chamber with continued compression of the portion which includes said first passage while keeping a portion which includes said second passage substantially uninfluenced, so that liquid squirts out through said second passage while at the same time flow of liquid through said first passage back into said main space is prevented; a first part forming a frame for mounting said container, and a second part displaceable towards and away from said first part, said second part forming a hood which substantially encloses said container, said member being arranged between said two parts in such a way that when said second part is in a normal position said member is held in its first position and when said second part is displaced in a direction towards said first part said member will be sequentially moved to its second and third positions, said member consisting of a plate including a first edge section positioned adjacent said first passage and a second edge section positioned adjacent said second passage and a middle portion between said edge portions and positioned adjacent said measuring chamber, said plate being carried by carrying means on one of said parts so as to be pivotable about said middle portion; first, second, and middle support surfaces, respectively, opposite said first edge section, second edge section, and said middle portion of said member, said member being capable of compressing portions of the container against said support surfaces; resting means for said member on the other part, said member being positioned to rest on said resting means between said middle portion and said second edge section; said member being movable to said first position to compress a portion of the container including said second passage against said second support surface, said second position under the influence of a movement of said second part to compress a portion of the container including said first passage against the first support surface, and said third position after a further movement of said second part to rest on said resting means and to be pivoted by pressure on said middle portion of said carrying means resulting in a swing out of said second edge portion from said second support surface thereby opening said second passage and a compression of said measuring chamber by said middle portion of said member against said middle support surface when said plate bends towards said middle support surface under the pressure from said carrying means while resting on its first edge section and on said resting means.

4,463,877

DEVICE FOR GUIDING A ROD-SHAPED MEMBER FORMED OF A GLUING MATERIAL WHICH CAN BE SOFTENED BY HEAT

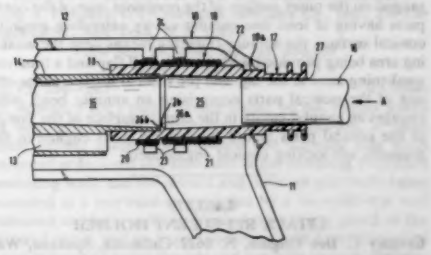
Hans Siwon, Obing, Fed. Rep. of Germany, assignor to Steinel GmbH & Co. K.G., Herzebrock, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 428,219

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1981, 3142363

Int. Cl.³ B67D *5/62*

U.S. Cl. 222—146 HE **11 Claims**



1. A device for guiding a rod-shaped member formed of a gluing material which can be softened by heat when inserted into the guide channel of a heating means, said guide device comprising an elastic flexible cartridge having a hollow guideway extending therethrough;

one end of said guideway telescopingly receiving the entry end of said heating means and the other end of said guideway receiving said rod;

sleeve means having first and second sleeve portions surrounding said cartridge, said first portion securing said cartridge to said heating means and said second portion encircling at least a portion of said cartridge removed from said heating means;

said sleeve being formed of a material for conducting heat.

4,463,878

CAP UNIT

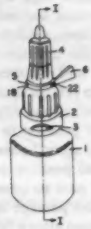
Axel Crone, Ellekrattet 18, DK-2950 Vedbak, Denmark

Filed Apr. 26, 1982, Ser. No. 371,729

Claims priority, application Denmark, Apr. 27, 1981, 1860

Int. Cl.³ B67B *5/00*; B67D *5/32*

U.S. Cl. 222—153 **13 Claims**



1. A cap unit for a container, provided with a pliable dropper and comprising a cap for fastening on the container via a fastening part, wherein the cap and the fastening part have a mutual connection area comprising mutually cooperating, complementary conical surfaces of a self locking conicity, and cooperating annular complementary engaging means of which one is formed of a resilient yieldable material integral with the fastening part via an annular weakening area.

12. A cap unit for a container, provided with a pliable dropper and comprising a cap for fastening on the container via a fastening part, wherein the cap and the fastening part in a mutual connection area comprise mutually cooperating, complementary conical surfaces of a self locking conicity, and cooperating annular complementary engaging means of which one is performed of a resilient yieldable material intergral with the cap via an annular weakening area, the fastening part forming a separate part to be mounted at the container neck, the fastening part furthermore comprising a shirt arranged at the lower end thereof and opposite its conical part for abutment against a shoulder of the container, said shirt being provided with at least two radially inwardly and upwardly extending locking barbs for engagement with an annular bead arranged on the outer surface of the container, one of the conical parts having at least one annular cavity extending around its conical surface, the annular engaging means with the weakening area being provided with a tearing off flap and a transverse weakening zone at the tag, and the conical surface of the other one of the conical parts comprising an annular bead, which engages an annular cavity in the conical surface of the first one of the conical parts before the conical parts engage in their mutually self-locking conical engagement.

4,463,879

ATTACK REPELLENT HOLDER

Gregory C. Des Voignes, N. 6622 Catherine, Spokane, Wash. 99208

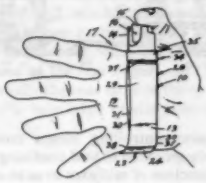
Filed Mar. 8, 1982, Ser. No. 355,672

Int. Cl.³ B65D *83/14*

U.S. Cl. 222—175 **18 Claims**

1. A holder for a hand held attack repellent device of the type including an elongated substantially cylindrical body extending from a base end to a manually operable actuator end and adapted to be held in the palm of a hand, said holder comprising:

securing means comprised of an elongated elastic band to be fitted over the hand in an orientation laterally spanning the palmar and dorsal surfaces thereof adjacent the knuckles to securely grip the hand;



pocket means on the securing means adapted to hold the substantially cylindrical body of the attack repellent device across the hand with the actuator end of the device protruding clear of the securing means, and accessible by one of the fingers of the same hand, such as the thumb; and

wherein the pocket means includes means adapted to grip the substantially cylindrical body of the repellent device to hold it securely against the wearer's hand and to resist axial movement of the body within the pocket means.

4,463,880

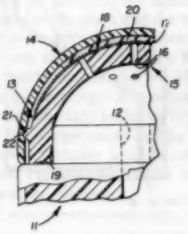
MEDICINE DROP DISPENSER WITH ANTI-BACTERIAL FILTER

Steven G. Kramer, and Edward Q. Yavitz, both of San Francisco, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Apr. 30, 1982, Ser. No. 373,355

Int. Cl.³ B67D *5/58*

U.S. Cl. 222—189 **17 Claims**



1. A liquid dispenser comprising

a container defining a liquid retaining chamber therein,

dispensing means defined at an upper end of said dispenser for providing the sole dispensing outlet from said chamber, and

an entirely hydrophobic and microporous anti-bacterial filter means secured in exposed relationship over said dispensing means for providing a barrier to the ingress of bacteria and particulate matter therethrough, for permitting the egress of sterile liquid from said chamber therethrough, and for repelling residual liquid therefrom, and

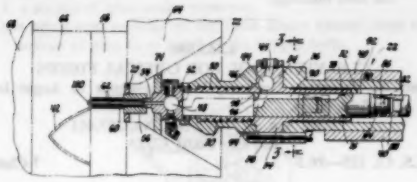
means for inducing coalescence of liquid dispensed through said dispensing means into droplet form including a convex surface, when viewed in cross-section, formed at the upper end of said dispenser and having said dispensing means defined therethrough and said filter means secured thereover.

4,463,881

INJECTOR FOR MOLDING HARDENABLE LIQUID PRECURSORS

William F. Dais, Washington, and Antoni J. Malarz, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 10, 1981, Ser. No. 329,390
Int. Cl.³ B67D 5/40
U.S. Cl. 222—375 4 Claims



2. In an injector for delivering a hardenable chemically reactive liquid constituent from an accumulator barrel to a mold in the making of a polymeric article, the improvement comprising

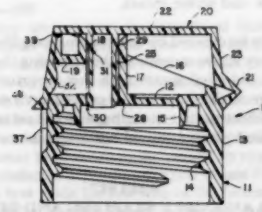
a plunger cooperative with said accumulator barrel for ejecting said constituent from the barrel into a mold, said plunger being reciprocatable in said barrel in close tolerance therewith such that in the molding of a said article said plunger reciprocates from a first retracted filling position whereat the barrel retains a predetermined amount of said liquid constituent to a second extended delivery position whereat said constituent is ejected from the barrel into the mold by the advancing face of the plunger, said plunger having a peripheral groove in its surface which communicates with an outlet in the face thereof, the groove being located such that it is in constant fluid-flow communication with a barrel inlet and a barrel outlet for said reactive constituent in and between said first and second plunger positions.

4,463,882

ONE-PIECE DISPENSING CLOSURE

Roy Hammett, Elburn, Ill., assignor to Panamerican Closures, Inc., Pompano Beach, Fla.

Filed Sep. 30, 1982, Ser. No. 431,278
Int. Cl.³ B67D 3/00
U.S. Cl. 222—543 7 Claims



1. A one-piece dispensing closure, comprising:

a closure body having means thereon for attachment to a container, said closure body having a bore therethrough and a discharge port in communication with the bore;

a cap integrally joined to the closure body and movable into and away from a closed position overlying the closure body;

an elongate plug member carried by the cap in a position to cooperate with the bore and effect a seal therewith when the cap is in the closed position, said plug member having spaced sealing areas thereon for effecting both a primary and a secondary seal in the bore when the cap is in its closed position, said primary seal being disposed ahead or upstream of the discharge port; and

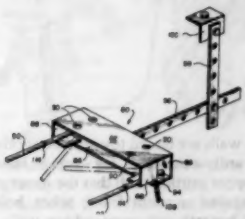
detent and seal means on the cap cooperable with complemental means on the closure body to detain the cap in both its open and closed positions, said detent and seal means cooperating with the discharge port to effect a seal therewith when the cap is in its closed position, whereby multiple seals are effected relative to both the bore and the discharge port when the cap is closed.

4,463,883

PORTABLE CLOTHES CLOSET BRACKET

Robert E. DeVore, Rte. 1, Box 451, Picayune, Miss. 39466

Continuation-in-part of Ser. No. 269,738, Jun. 2, 1981. This application Aug. 20, 1982, Ser. No. 409,971
Int. Cl.³ B60R 9/06
U.S. Cl. 224—42.44 4 Claims



1. Apparatus for removably attaching an object to a vehicle comprising a bracket adapted to be fixed to a vehicle, first and second arm means for removably receiving said object, first and second pivotal mounting means for mounting each of said first and second arm means respectively to said bracket so that said arm means are pivotable from a first position wherein said arm means extend on the same side of said bracket and outwardly from said bracket to a second position wherein said arm means do not extend from said bracket, said arm means being adapted to pivot about parallel axes in opposite directions so that when in said second position each of said arm means extends in the direction of a line connecting said first and second pivotal mounting means, and support means comprising elements which are spaced from said pivotal mounting means and extend transverse to said first and second arm means when said means are in said first position and engage said first and second arm means only when said arm means are in said first position to support the weight of said object.

4,463,884

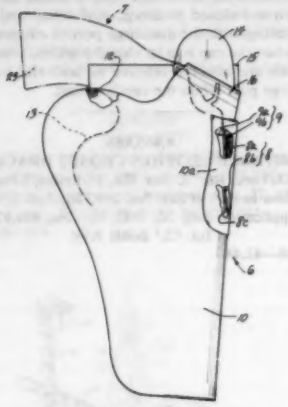
SECURITY HOLSTER FOR REVOLVER-PISTOL

Henry J. Parlante, c/o Courtlandt Bootjack Co., Inc., 270 Lafayette St., New York, N.Y. 10012

Filed Sep. 19, 1983, Ser. No. 533,230
Int. Cl.³ F41C 33/02
U.S. Cl. 224—243 8 Claims

1. A holster for a pistol having frame, barrel, trigger guard and hand-grip handle, comprising in combination: a pistol holster having spaced-apart inward and outward side walls connected at forward and rearward edges including a forward connecting wall, and the inward and outward side walls being connected at a rearward-top location by a rearward-top wall positioned to block vertical draw of the trigger guard of the holstered pistol, and an upper portion of said forward wall at an upper location being flexible and movable in each of opposite horizontal directions forwardly and reawardly such that the pistol when holstered is drawable obliquely forwardly of said rearward-top wall when said upper portion is flexed forwardly, an improvement being a serpentinely-shaped resilient spring inclusive of at least one central upwardly-extending leg

having upper and bottom opposite ends thereof, the bottom end being continuous with at least one upwardly-extending outer leg anchored in at least one of said inward and outward side walls such that upper forward portions of the inward and



outward side walls are biased toward one another, and said one central upwardly-extending leg being biased rearwardly against said upper portion such that the upper portion is biased rearwardly against a pistol frame when holstered with its trigger guard beneath said rearward-top wall.

4,463,885

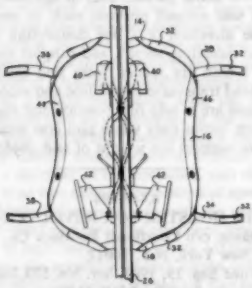
SKI CARRIER STRAP

Joel E. Ball, and Brian R. Ball, both of West Haven, Conn., assignors to Nörs A/S of America, Inc., Clinton, Conn.

Filed Dec. 10, 1982, Ser. No. 448,433

Int. Cl.[3] **A45C** *71/00*

U.S. Cl. 224—250 **15 Claims**



1. A carrier strap for carrying a pair of skis of the type having toe bindings and heel bindings, comprising:

an endless loop member of flexible foldable material having a forward portion, a middle portion and a rearward portion, comprising opposing right and left side segments extending forwardly and rearwardly;

a forward fastener means for detachably fastening said right side segment to said left side segment at said forward portion of said loop member to form a smaller forward loop, of sufficient size to encircle a pair of skis in engagement with the forward end of the toe bindings;

a rearward fastener means for detachably fastening said right side segment to said left side segment at said rearward portion of said loop member to form a smaller rearward loop, of sufficient size to encircle a pair of skis in engagement with the rearward end of the heel bindings; and

said right side segment and said left side segment of said middle portion of said loop member between said forward and rearward fastener means coacting to form a dual segment handle grip to carry the pair of skis when said forward loop encircles the skis in engagement with the forward end of the toe bindings and said rearward loop encircles the skis in engagement with the rearward end of the heel bindings.

4,463,886

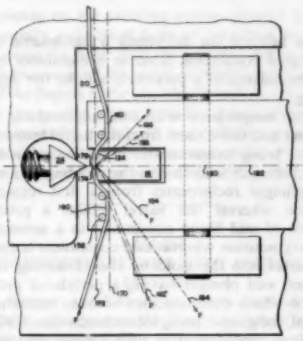
CLEAVING TOOL FOR OPTICAL FIBERS

Leif N. Thornton, Hanover, Mass., assignor to Augat Inc., Mansfield, Mass.

Filed Apr. 12, 1982, Ser. No. 367,461

Int. Cl.[3] **C03B** *37/16*

U.S. Cl. 225—96.5 **7 Claims**



1. A cleaving tool for separating an optical fiber comprising:

a base;

an optical fiber retaining block mounted on said base and having a groove adapted to receive an optical fiber, said block having an end with which said groove communicates;

stationary scribe means mounted on said base and positioned adjacent said end to one side of the centerline of said groove; and

outwardly curved anvil means mounted on said base and positioned to the other side of said centerline diametrically opposite said scribe means,

whereby

a fiber may be cleaved by first moving said fiber against said stationary scribe means and then pressing the scribed fiber against said anvil means such that a portion of said fiber conforms to the shape of said curved anvil means and such that the fiber portions to either side of said anvil means are maintained parallel to said centerline in a vertical plane.

4,463,887

WOOD ASSEMBLY STAPLING AND BONDING APPARATUS

David W. Bloys, 4911 - 16th St., Lubbock, Tex. 79417

Filed Aug. 6, 1982, Ser. No. 405,924

Int. Cl.[3] **B27F** *7/06*

U.S. Cl. 227—7 **4 Claims**

1. A machine for making an elongated channel having a web and two legs comprising:

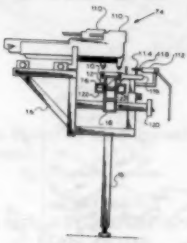
a. a main frame,

b. a supply table on the main frame having a front and back with

c. a web magazine in the middle thereof,

d. two leg magazines, one on each side of the web magazine,

e. a back sprocket on the main frame behind the supply table,
f. a front sprocket on the main frame in front of the supply table,
g. a continuous chain having a top run trained around the back and front sprocket,
h. the top run under the web magazine and between the leg magazines,
i. at least three lugs on the chain,
j. each lug having three fingers, one each to engage the web and each leg,
k. a source of glue under pressure,
l. a bifurcated conduit on the main frame extend from the source of glue to in front of the supply table,



m. said conduit terminating over each leg in front of the supply table to apply glue thereto,
n. a spacer block on the main frame in front of the front sprocket,
o. two leg pressure means on the main frame, one on each side of the spacer block, for pressing the legs firmly against the spacer block,
p. a web pressure means on the main frame pressing the web firmly against the glue on top of the legs,
q. two staplers on the main frame, one over each leg at the spacer block, and
r. an air valve fluidly connected to the staplers for actuating the staplers to drive a staple through the web into the legs.

4,463,888

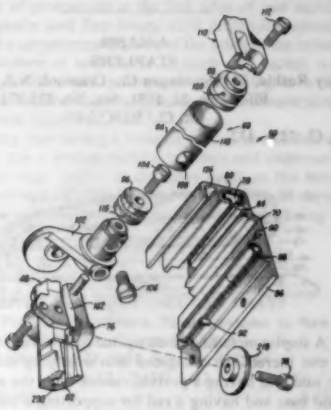
FASTENER DRIVING TOOL

Bernard W. Geist, Melrose Park; Edmund Frank, Chicago; Richard H. Doyle, Mount Prospect, and Raymond F. Novak, Itasca, all of Ill., assignors to Duo-Fast Corporation, Franklin Park, Ill.

Filed Apr. 22, 1981, Ser. No. 256,409
Int. Cl.³ B25C *1/04, 7/00*
U.S. Cl. 227—109 **26 Claims**

1. A fastener driving tool for uncollated fasteners having heads and shanks comprising a tool body including a drive track, a driver blade movable in the drive track, an escapement mechanism for advancing single fasteners into the drive track, and a magazine for feeding a row of fasteners to the escapement mechanism, said magazine including an elongated base frame member having a similar cross section throughout its length, a fastener head slideway defined by an upper portion of said frame member, a depending portion of said frame member supporting a first guide for one side of the fastener shanks, an elongated tubular member supported on the opposite side of said shanks defining a second guide for the opposite side of the fastener shanks, and means including a pair of eccentric support members engaging the ends of said tubular member for mounting said tubular member for movement toward and away from said first guide upon rotation of said tubular member.

11. A fastener driving tool for driving fasteners having shanks and points into a workpiece, said tool comprising a tool body including a nose portion, a fastener drive path defined in said nose portion and extending to an exit end adjacent a workpiece engaging end of the nose portion, a driver blade movable in a drive stroke through said drive track toward said workpiece engaging end to drive a fastener into the workpiece, a magazine including means for holding a supply of fastners, feeding means for advancing single fasteners from said magazine to said drive track, a drop-off member supported adjacent the workpiece engaging end of said nose portion, said drop-off



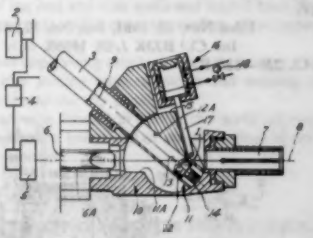
member being mounted for pivotable movement and normally being held by gravity in a normal position coinciding with a wall of the exit end said drive track and stop means for preventing movement of said drop-off member into said drive track.

4,463,889

SPECIAL SCREW FEED MECHANISM FOR SCREWS, BOLTS, RIVETS, NAILS, ETC.

Bernard C. Sartran, Filderstadt, Fed. Rep. of Germany, assignor to The Aro Corporation, Bryan, Ohio

Filed Mar. 25, 1982, Ser. No. 361,725
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1981, 3112520
Int. Cl.³ B25C *3/00*
U.S. Cl. 227—112 **8 Claims**



1. An improved screw feed mechanism comprising, in combination:
a housing having a throughbore defining a tool axis, a magazine chamber on the axis separating the throughbore into a tool bore and a collet bore;
a tool in the tool bore translatable along the axis through the region of the chamber;
fastener supply means;
a fastener magazine in the chamber, said magazine including a throughbore for receipt of a fastener, said magazine mounted in the chamber for pivotal movement about an axis transverse to the tool axis on a pivot substantially

intersecting the tool axis between a first position aligning the magazine throughbore with the tool axis and a second position for receipt of a fastener from the fastener supply means; and

pneumatic means for pivoting and aligning the magazine in at least one of the positions.

4,463,890

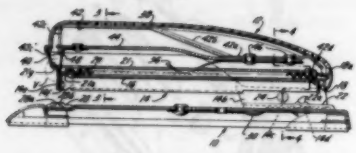
STAPLERS

Henry Ruskin, 21 Nomahegan Ct., Cranford, N.J. 07016

Filed Dec. 22, 1981, Ser. No. 333,372

Int. Cl.³ B25C *5/06*

U.S. Cl. 227—132 **11 Claims**



1. A stapler including an elongated base having an anvil near one end thereof, an elongated arm overlying said elongated base, said arm having a portion remote from the anvil pivoted to said base and having a rail for supporting a stick of staples with its lead staple free of an end of the rail opposite the anvil, and staple-driving means overlying the arm, said staple-driving means including a staple driver retracted from the staples in the at-rest condition of the apparatus, spring means for operating the staple driver, a stop carried by said arm and cooperable with a latch portion of the staple driver for arresting the staple driver against operation by the spring means, and manual actuating means for developing progressively increased energy stored in said spring means, said apparatus having means for biasing a portion of the staple driver for cooperation with the stop, and said manual operating means having a releasing portion acting on said staple driver for disengaging the latched portion thereof from said stop, thereby releasing the staple driver to staple work on said anvil.

4,463,891

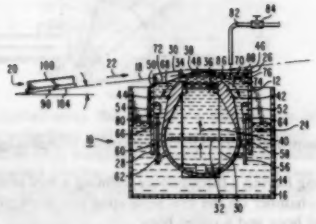
WAVE SOLDERING APPARATUS AND METHOD

Howard G. Scheible, Livingston, and Jon B. Berkshire, Clarksburg, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 18, 1981, Ser. No. 322,589

Int. Cl.³ B23K *1/08*; H05K *3/34*

U.S. Cl. 228—180 R **13 Claims**



1. A continuous process for soldering component leads to a conductor on a printed circuit board surface comprising:

applying hot molten solder to said surface to cause the solder to adhere to the leads and conductor; and

applying hot oil to the solder adhering to said leads and said conductor by passing said surface directly into a hot oil pool immediately after applying said hot molten solder without exposing said applied solder to any cooling medium.

4,463,892

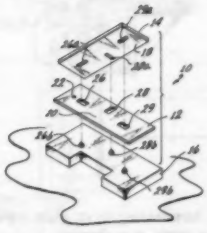
METHOD FOR MANUFACTURING IC PACKAGES

Michael D. Cusack, Ramona, and Kenneth B. Turnbaugh, Redondo Beach, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 125,450, Feb. 28, 1980, abandoned. This application Mar. 10, 1982, Ser. No. 356,845

Int. Cl.³ B23K *31/02*

U.S. Cl. 228—212 **10 Claims**



6. For use in a bonding operation, a method of maintaining the alignment of a planar-shaped part as said part is heated and thermally expands, said method including the steps of:

forming oblong-shaped slots in said part arranged about the center of minimum thermal expansion in the plane of said part,

each of said slots having a center line an extension of which intersects said center and having end walls intersecting said center line,

providing a fixture having pins arranged perpendicular to said plane which fit into said slots;

placing said part on said fixture with said pins in said slots; and

heating and thermally expanding said part;

the relationship of the slots and pins being such that said pins move along said center lines without engaging the end walls of said slots when said part thermally expands in response to said heating step.

4,463,893

REPLACEABLE LID FOR FLANGED TRAYS

William T. Brunone, Plymouth; Duane Mode, Eden Prairie, both of Minn., and Michael R. Russell, Grand Ledge, Mich., assignors to Champion International Corporation, Stamford, Conn.

Filed Feb. 18, 1983, Ser. No. 467,737

Int. Cl.³ B65D *5/64*

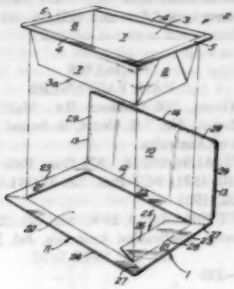
U.S. Cl. 229—43 **11 Claims**

1. A one-piece paperboard blank for forming a lid adapted to close the top of a flanged tray, said blank comprising:

(a) a top panel;

(b) a bottom panel connected to a side edge of said top panel along a fold line, said bottom panel being approximately the same size and shape as said top panel, and said bottom panel having a central opening therein adapted to receive the flanged tray, and being defined by a plurality of peripheral elements interposed between adjacent outer edges of said bottom panel which peripheral elements surround said opening; and

(c) a pair of perforated tear lines extending from an edge of said opening across one of said peripheral elements at



opposite ends thereof to a corresponding outer edge of said bottom panel.

4,463,894

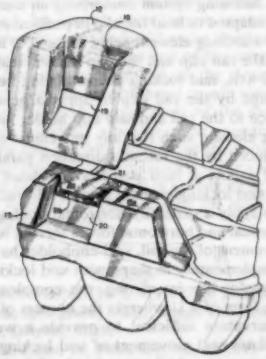
METHOD AND MOLD FOR MAKING AN IMPROVED EGG CARTON

John Daines, Rushville, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 299,683, Sep. 8, 1981, abandoned. This application Sep. 12, 1983, Ser. No. 531,186

Int. Cl.³ B65D *5/66, 1/24*

U.S. Cl. 229—44 EC **3 Claims**



1. A carton adapted for the packaging of eggs and the like comprising:

a bottom tray formed to define a plurality of cells for reception of eggs and of a depth such that said eggs are enclosed thereby for a portion less than their vertical dimension as packaged;

a dished cover resiliently hinged to the rear upper edge of said tray and having a front wall, a back wall, and end walls fixed to each other and to a top for said cover, all of such dimensions situated so that said eggs are substantially enclosed within the edges of said tray, said front wall lying primarily in a plane sloping inwardly toward said top;

a latching flap hinged to the front upper edge of said tray front wall, said flap hinge biasing said flap toward an outward position;

a plurality of recesses in said front wall of said cover each having a surface which is inwardly offset with respect to said front wall and lying in a plane sloping upwardly toward said top; said recess having a hole in said surface cut in a plane that extends perpendicular to the plane of the top of said cover, said hole being substantially flush with said surface which is inwardly offset with respect to said front wall;

a plurality of recesses in said latching flap complementary to the recesses in said front wall of said cover;

a plurality of protrusions at the free edge of said matching flap opposite said flap hinge, each protrusion extending through a complementary one of the holes in the inwardly offset surface of said cover to latch said carton in the closed position, said protrusion terminating in a sharp undercut for latching engagement with a complementary one of said holes; and

said latching flap having a beveled surface at said free edge thereof, and a sloping surface between said undercut and said free edge angled at the same angle as the beveled surface of said latching flap and lying entirely in the same plane as said beveled surface for aiding in closing said carton.

4,463,895

COVER FOR RECTANGULAR TRAYS

William D. Pasquale, Northboro, Mass., assignor to New England Envelope Mfg. Co., Worcester, Mass.

Filed Sep. 23, 1982, Ser. No. 421,964

Int. Cl.³ B65D *5/42*

U.S. Cl. 229—49 **6 Claims**

1. Cover for a rectangular tray, comprising:

(a) a rectangular top panel,

(b) two opposed end walls, each hingedly connected to the top panel at an end edge thereof,

(c) two opposed side walls, each hingedly connected to the top panel at a side edge thereof,

(d) a triangular panel hingedly connected to each end edge of each of the end and side walls and folded back against and fastened to the adjacent inner surface of its respective wall, and

(e) a U-shaped clip having two legs, each leg having a lower end, the clip joining adjacent walls and holding them perpendicular to the top panel,

wherein a window is formed in one of the walls adjacent to each clip to expose the lower end of one of the legs of the clip to assist in its removal.

4,463,896

METHODS AND APPARATUS FOR THE CONTROL OF SMOKE AND FIRE IN BUILDINGS

Herbert J. Schaus, 4853 Wolf Way, Concord, Calif. 94521

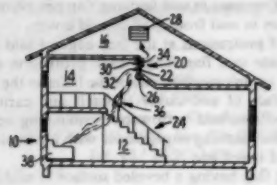
Filed Mar. 11, 1982, Ser. No. 357,143

Int. Cl.³ F24F *13/14*

U.S. Cl. 236—49 **7 Claims**

4. A smoke control system comprising a plurality of smoke control valve means which control the passage of smoke through the same smoke passage, and in which one of said smoke control valve means also functions as a curtain board, further comprising smoke responsive means for opening said one of said smoke control valve means and enabling it to function as a curtain board in response to the presence of smoke in the vicinity of said smoke control system, and further compris-

ing temperature responsive means for closing another one of said smoke control valve means in response to the elevation of the temperature of gases passing through said smoke control



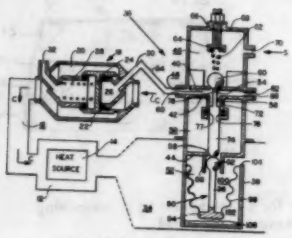
valve means, and means for re-opening said another one of said smoke control valve means in response to the lowering of the temperature of gases adjacent said smoke control valve means.

4,463,897

COOLING CONTROL SYSTEM APPARATUS AND METHOD

James A. Denneny, Jr., Scottsdale, and Charles M. Rowland, Phoenix, both of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Mar. 18, 1982, Ser. No. 359,544
Int. Cl.³ G05D *27/00*
U.S. Cl. 236—92 R **10 Claims**



2. Temperature control apparatus for controlling the flow rate of a gaseous temperature conditioning fluid through an enclosure in response to the relative heat carrying capacity of said fluid, said apparatus comprising:

means for controlling said fluid flow rate in response to a control signal;

means for simultaneously sensing the temperature and pressure of said temperature conditioning fluid, said sensing means including a body substantially defining a single closed variable-volume cavity therein, a predetermined quantity of elastic temperature and pressure responsive medium disposed within said cavity, said body being exposed to the interior of said enclosure in pressure-transmitting relation with said fluid therein, and said body placing said medium in heat-transfer relation with said fluid, said body comprising a bellows member, said body further including an elongate stem member having a flange portion at one end thereof, said bellows member being of elongate annular configuration having open ends, one of said ends of said bellows member sealingly coupling with said flange portion at the perimeter thereof, said bellows member and said flange portion cooperating to bound said cavity;

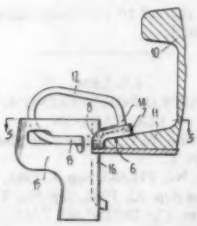
means responsive to said sensing means for generating said control signal in response to said sensed temperature and pressure, said generating means including a housing defining a flow path therethrough and a valve element movably disposed within said housing, said valve element shifting between a first position engaging said housing to close communication through said flow path and a second position spaced from said housing to open communication through said flow path, and means for drivingly coupling said stem member with said valve element to move the latter between said first and said second positions.

4,463,898

RAIL FASTENERS

Hartley F. Young, 200 Coburns Rd., Melton, Victoria, and Wally A. Remes, No. 7 S. Court, Redwood Park, South Australia, both of Australia

PCT No. PCT/AU80/00028, 371 Date Feb. 10, 1981, 102(e) Date Feb. 10, 1981, PCT Pub. No. WO81/00121, PCT Pub. Date Jan. 22, 1981
PCT Filed Jul. 3, 1980, Ser. No. 237,124
Claims priority, application Australia, Jul. 5, 1979, PD9465
Int. Cl.³ E01B *9/30*
U.S. Cl. 238—310 **5 Claims**



1. A rail fastening system comprising an elastic rail clip, a clip holder adapted to hold the clip in position on the flange of the rail and a locking element being adapted to lie between the rail flange, the rail clip and the clip holder, said rail having a longitudinal axis, said locking element being held down onto the rail flange by the rail clip to apply a generally vertical holding force to the rail and said clip holder interfitting with said locking element such that any movement of said locking element induced by the rail in a direction parallel to the rail longitudinal axis is at least partially translated into a lateral pressure of said locking element against said rail in an amount sufficient to apply a generally horizontal holding force to the rail, said vertical and horizontal forces serving to retard longitudinal movement of the rail, said clipholder having an external face complementary in shape with said locking element to provide a wedge-like interfitting, the complementary shape being in the form of a U wherein the corners of the U have a radius of curvature sufficient to provide a wedging action which translates said movement of said locking element into said lateral pressure and where each side of the U is inclined at an angle to the base of the U sufficient to provide a wedging action which translates movement of said locking element into said lateral pressure.

4,463,899

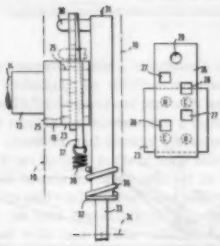
RELATING TO SHOWER FITTINGS

Percy G. Tacchi, Middle Scriven, Bridgnorth, Salop WV 16 6AG, England

Filed Dec. 24, 1981, Ser. No. 334,422
Int. Cl.³ B05B *7/00*
U.S. Cl. 239—75 **4 Claims**

1. In or for a shower fitting of the type which is adapted to be connected to supplies of hot and cold water and which is adapted to provide a supply of water, the temperature of which may be varied by varying the proportions in which the hot and cold water are mixed together, the fitting comprising a shower head comprising inlet connection means for the inlet of water and an outlet from which water flows from the shower head,

the improvement wherein the shower head comprises an elongate body which is formed internally to provide a mixing chamber, an inlet connection manifold being provided on the body to which separate hot and cold water supply conduits may be connected, the hot and cold water flowing into the chamber wherein it is mixed, the proportions in which the hot and cold water flow into the mixing chamber, and hence the temperature at which the water flows from the outlet, being controlled by thermostatically controlled valve means mounted on the body of the shower head, said valve means including a linearly expandable and contractable temperature responsive device which is under the influence of the temperature of the water mixture and which operates a movable valve member to control the proportions of hot and cold water entering the mixing chamber, and a manually operable control



member on the body of the shower head, the movable valve member being slidable in the body and being in the form of a flat plate provided with control ports and having sliding engagement with a flat face or faces of a valve block which has supply ports therein connected to the inlets for the hot water and cold water, one end of the flat plate being connected to one end of the temperature responsive device, the other end of the device being in engagement with means connected to said manually operable control member on the body of the shower head, there being provided a wedge plate engaging said flat plate on the side thereof remote from the valve block, the wedge plate being slidable in relation to the valve block so as to apply pressure, by means of a wedging action, to said flat plate to press the plate against the said flat face or faces of the valve block.

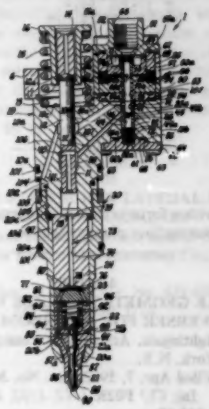
4,463,900

ELECTROMAGNETIC UNIT FUEL INJECTOR

Thomas J. Wich, Springfield, Mass., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 12, 1983, Ser. No. 457,417
Int. Cl.³ F02M *49/00, 55/00*
U.S. Cl. 239—88 **4 Claims**

1. An electromagnetic unit fuel injector including a housing means having a pump cylinder means therein; an externally actuated plunger reciprocable in said cylinder means to define therewith a pump chamber; said housing means including a valve body having a spray outlet at one end thereof for the discharge of fuel; an injection valve means movable in said valve body to control flow through said spray outlet; a discharge passage means connecting said pump chamber to said spray outlet as controlled by said injection valve means; said housing means further including a supply/spill chamber means and a spring chamber means in axially spaced apart relationship to each other with a valve stem guide bore extending therebetween and with a conical valve seat encircling said guide bore at the supply/spill chamber end thereof; a passage means in said housing means in flow communication at one end with said pump chamber and at its other end with said guide bore next adjacent to said valve seat; a hollow, pressure sensitive valve operatively positioned in said housing means, said valve having a stem slidably received in said guide bore and a head loosely received in said supply/spill chamber with a valve seating surface for movement relative to said valve seat, the valve seating surface thereof being adapted to seat against said valve seat at a predetermined distance radially outward of said guide bore, said stem including a reduced diameter stem portion next adjacent to said valve seating surface of said head whereby to define with said guide bore an annulus chamber in fluid communication with said other end of said passage means; a push type solenoid means operatively supported in said housing means, said solenoid means including an armature means



operatively associated with said valve; a first spring means operatively associated with said armature means to normally bias it into operative engagement with said valve; a second spring means, of a force greater than said first spring means, operatively associated with said valve to normally bias said valve seating surface of said head thereof out of seating engagement with said valve seat; and, a fuel passage means connectable at one end to a source of fuel at a suitable supply pressure and at its other end being in operative flow communication with said supply/spill chamber.

4,463,901

UNIT FUEL INJECTOR HAVING INDEPENDENTLY CONTROLLED TIMING AND METERING

Julius P. Perr, and Lester L. Peters, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jul. 29, 1982, Ser. No. 403,066
Int. Cl.³ F02M *45/00*
U.S. Cl. 239—95 **14 Claims**

14. A periodic fuel injector, comprising

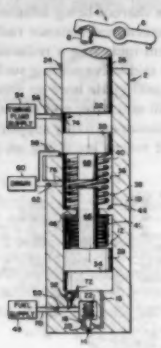
(a) an injector body containing a central bore and an injection orifice at the lower end of the body;

(b) metering means for metering a variable quantity of fuel for injection through said injection orifice on a periodic basis dependent upon the pressure of fuel supplied to said injector body, said metering means including a lower plunger section mounted for reciprocal movement within said central bore;

(c) hydraulic timing means for varying the timing of each periodic injection of metered fuel dependent upon the pressure of a hydraulic timing fluid supplied to said injector body, said hydraulic timing means including an upper plunger section mounted for reciprocal movement within said central bore and an intermediate plunger section mounted for reciprocal movement within said central bore between said upper and lower plunger sections; and

(d) biasing means mounted between said intermediate plunger section and said lower plunger section for biasing said intermediate plunger section upwardly with a force

which is independent of the position of said lower plunger section and for biasing said lower plunger section down-



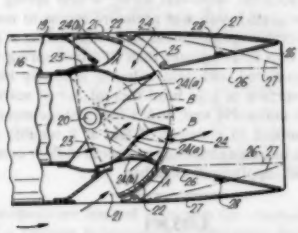
wardly with a force which is independent of the position of said intermediate plunger section.

4,463,902

VARIABLE GEOMETRY NOZZLE WITH THRUST REVERSER FOR A TURBOMACHINE

Douglas J. Nightingale, Atlanta, Ga., assignor to Rolls-Royce Inc., New York, N.Y.

Filed Apr. 7, 1982, Ser. No. 366,390
Int. Cl.³ F02K *1/12, 1/32, 1/60*
U.S. Cl. 239—265.17 **3 Claims**



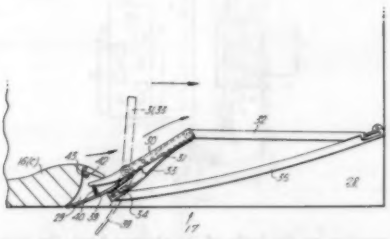
1. A nozzle for a gas turbine aero engine comprising: spaced inner and outer ducts; a pair of confronting walls extending downstream of the ducts; one or more inlet openings adjacent a downstream end of the outer duct; a pair of mutually confronting doors extending between the pair of walls and located downstream of the inner duct, each of which is mounted for rotation about an axis extending transverse to the length of the inner duct, each of the doors being movable to, and from, a first position, where they define therebetween a substantially unrestricted flow path through the inner duct and nozzle, to and from, a second position, where they serve to define a convergent throat for the nozzle; a corrugated mixer chute assembly attached to a downstream end of each first door, the assembly being constructed to define alternate first and second chutes, the first chutes leading from an inlet opening into the flow path through the inner duct and nozzle, and the second chutes leading from the inner duct to the nozzle exit; a second pair of confronting doors each of which is mounted for rotation about an axis extending transverse to the length of the ducts and movable to, and from, a first position, where they obturate the inlet openings, through a second position, where they uncover the inlet openings, to and from a third position, where they uncover the inlet openings, obturate the flow path through the inner duct and nozzle, and redirect gases flowing through the inner duct out through the inlet openings; a pair of first flaps extending between the said pair of walls of which is pivotally mounted at its upstream end to structure downstream of the mixer chute assembly, the pair of first flaps being operable to define boundary walls of the flow path through the nozzle at a region downstream of the first doors; and a pair of second flaps extending between the said pair of walls, each of which is pivotally mounted at its upstream end to structure downstream of the inlet openings, is located outboard of each first flap, and is in sliding engagement at its downstream end with the downstream end of one of the first flaps.

4,463,903

TURBOMACHINE EJECTOR NOZZLE

Douglas J. Nightingale, Atlanta, Ga., assignor to Rolls-Royce Inc., New York, N.Y.

Filed May 10, 1982, Ser. No. 376,506
Int. Cl.³ F02K *1/12, 1/09, 1/28*
U.S. Cl. 239—265.17 **8 Claims**



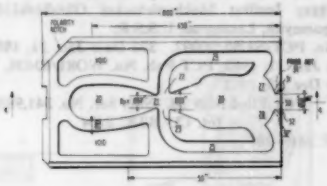
1. An ejector nozzle for a gas turbine aero engine comprising: a duct; a pair of mutually confronting sidewalls extending downstream of the duct; one or more air outlet openings at the downstream end of the duct; a pair of first flaps extending between the sidewalls, each first flap being pivotally mounted downstream of the openings, for rotation about an axis which extends transverse to the duct, which axis passes through a region of the flap intermediate its upstream and downstream ends, and each of the first flaps being provided with slots in that portion between its pivotal axis and its downstream end; a plurality of links each of which is pivotally mounted at one end on structure which is fixed relative to the duct so as to rotate about an axis transverse to the duct; a pair of second flaps which extend between the sidewalls, each second flap being pivotally connected at an upstream end to the free end of one or more links; a pair of third flaps extending between the side walls, each third flap being pivotally attached at its downstream end to the upstream end of one of the second flaps; a pair of fourth flaps extending between the side walls, each fourth flap being pivotally attached at its upstream end to the upstream end of one of the third flaps, and pivotally attached at its downstream end to the downstream end of one of the second flaps; and actuation means operable to rotate the first flaps about their axes of pivotal movement to and from a first position where the first flaps obturate the said outlet openings and define a boundary wall of gas flow path through the nozzle, to and from a second position where they co-operate with the third flaps to define a convergent part of the nozzle, and to and from a third position where they uncover the openings and co-operate with the third flaps obturate the duct and constitute deflecting surfaces which redirect gases flowing through the nozzle out through the outlet openings, the actuation means being operable to rotate the links and swing the second, third, and fourth flaps bodily about the axes of pivotal attachment of the links to the said structure thereby, in at least one position of the links, to define an air intake opening on the downstream outer side of the first flaps and, in at least a second position of the links, to close off the air intake, cause the third flaps to co-operate with the first flaps to define a convergent part of the nozzle and cause the second flaps to define a divergent part of the nozzle immediately downstream of the first and third flaps.

4,463,904

COLD WEATHER FLUIDIC FAN SPRAY DEVICES AND METHOD

Harry C. Bray, Jr., Laurel, Md., assignor to Bowles Fluidics Corporation, Silver Spring, Md.

Filed Nov. 8, 1978, Ser. No. 959,112
Int. Cl.³ B05B 1/08
U.S. Cl. 239—284 R **3 Claims**



1. In fan spray apparatus for a windshield washer system of an automobile including: an oscillation chamber having left and right side walls having curved portions leading to an outlet throat, a power nozzle for introducing a liquid power jet into said oscillation chamber and control passages for introducing control signals from control ports to each side of the power jet issuing from said nozzle to cause said jet to be cyclically deflected as it leaves said outlet throat, and means for introducing control signals to said control passages, said outlet throat coaxially aligned with said power nozzle and having a cross-sectional area related to the cross-sectional area of said power nozzle so as to provide a liquid fan spray of a predetermined fan angle and directed towards said windshield, the improvement comprising:

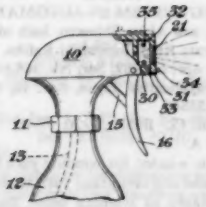
said oscillation chamber having a pair of top and bottom walls diverging from each other in the direction of said outlet throat so as to expand said power jet in cold weather, when the cleaning liquid to be sprayed has increased surface tension and viscosity, while maintaining essentially the same fan angle of the cyclically deflected jet, in a direction transverse to the direction of travel thereof in advance of said outlet throat.

4,463,905

FOAM-GENERATING PUMP SPRAYER

Paul R. Stoesser; John E. Cuzic, both of Midland, and John W. McLaren, Beaverton, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 919,595, Jun. 27, 1978, abandoned. This application Sep. 14, 1981, Ser. No. 301,797
Int. Cl.³ B05B 1/26, 11/00
U.S. Cl. 239—329 **5 Claims**



1. A hand-held, foam-spraying apparatus for producing a foam comprising a liquid matrix containing discrete air bubbles comprising

(a) a trigger-operated hand dispensing pump, including an atomizing nozzle, for drawing a foamable liquid from a container and ejecting it into the atmosphere through the atomizing nozzle, thereby forming an atomized spray from such liquid and projecting the spray in a predetermined pattern outwardly from the atomizing nozzle, and

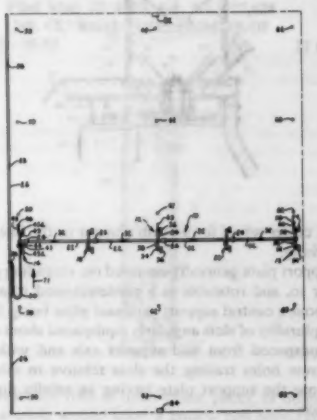
(b) foam-forming means operatively associated with the dispensing pump for producing foam from the spray without substantially modifying the predetermined spray pattern, the foam-forming means consisting essentially of (1) a screen having a size in the range of about 60 to 200 mesh U.S. Sieve Series and being retained in the path of the spray a distance of from about 0.8 to about 4 mm from the atomizing nozzle, and (2) means for introducing air into the spray so that the spray is permitted to foam upon contact with the screen, said means for introducing air comprising the peripheral edge portion of the screen disposed outwardly of the spray pattern at the point it intercepts the screen whereby air is permitted to enter from the front; the foam-forming means permitting the passage of substantially all the spray therethrough without contact except by the screen.

4,463,906

GUIDANCE SYSTEM FOR LATERAL MOVE IRRIGATION MACHINES

Richard F. Reinke, and Ronald J. Coash, both of Thayer County, Nebr., assignors to Reinke Manufacturing Co., Inc., Deshler, Nebr.

Filed Sep. 22, 1982, Ser. No. 421,477
Int. Cl.³ B05B 3/18
U.S. Cl. 239—720 **9 Claims**



1. In an irrigation machine having a plurality of mobile support units spaced apart from one another, an elongate irrigation boom mounted on said support units at an elevated position above the field to be irrigated, means for supplying water to said boom, a plurality of outlets spaced along the boom for applying water to the field, and drive means for each support unit for driving same through the field, a guidance system for the boom comprising:

means for normally activating the drive means for each support unit to drive the irrigation boom through the field;

means establishing a check point in the field for at least two selected support units, said check points being spaced apart in the field to define a substantially straight line extending generally perpendicular to the intended direction of travel of the boom when the boom crosses the check points;

means for deactivating the drive means for said selected support units when each of the selected support units reaches its check point, whereby the boom extends generally along the substantially straight line defined by the

check points when the check points have been reached; and

override means for overriding said deactivating means in a manner to effect activation of the drive means for said selected support units when all of the selected support units have reached their check points.

4,463,907

CUTTER WHEEL FOR BRUSH CHIPPER

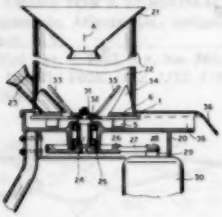
Horst Biersack, Sachsen, Fed. Rep. of Germany, assignor to Crones & Co. GmbH, Ansbach, Fed. Rep. of Germany

Filed Nov. 9, 1981, Ser. No. 319,658

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 3042950

Int. Cl.³ B02C *18/00*

U.S. Cl. 241—92 8 Claims



1. A cutter wheel for a brush chipper or the like, said wheel comprising:

a support plate generally centered on, extending perpendicular to, and rotatable in a predetermined rotational sense about a central support axis, said plate being formed with a plurality of slots angularly equispaced about and radially equispaced from said support axis and with respective screw holes trailing the slots relative to said rotational sense the support plate having an axially directed plate face;

a plurality of blades each having an annular periphery forming an annular cutting edge, said blades being centered on respective blade axes and each having at the respective blade axis a throughgoing attachment hole and each having a blade face turned toward the plate face;

respective attachment screws engaged through said attachment holes with said screw holes with any portion of said cutting edge directed forward in said rotational sense and the respective blades fixed on the support plate, whereby the attachment screws can be loosened to allow angular displacement of the blades thereon to expose a fresh portion of the respective edge at the respective slot;

means including interengaging formations on said plate and blades and angularly equispaced about said screw holes for locking of each of said blades on said plate in any of a plurality of positions angularly offset about the respective blade axis and in each of which a respective cutting edge is directed forward in said rotational sense, the interengaging formations including a plurality of recesses on one of said faces and a bump on the other face selectively engageable in the recesses.

4,463,908

DEVICE FOR CLAMPING THE ADJUSTMENT RING OF A CONE CRUSHER

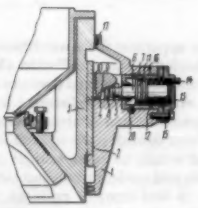
Nikolai A. Ivanov; Boris G. Ivanov; Leonid P. Zagoratsky; Evgeny S. Mitrofanov; Vladimir A. Cherkassky; Georgy A. Finkelshtein; Ilya I. Blekhman; Oleg P. Barzukov, all of Leningrad; Gennady A. Kaljunov; Isaak Y. Khinich, both of Sverdlovsk, and Vladimir Y. Turkin, Leningrad, all of U.S.S.R., assignors to Vsesojuzny Nauchnoissledovatelsky I Proektny Institut Mekhanicheskoi Obrabotki Poleznykh Iskopaemykh, Leningrad, U.S.S.R.

PCT No. PCT/SU80/00092, 371 Date Jan. 11, 1982, 102(e) Date Jan. 11, 1982, PCT Pub. No. WO81/03438, PCT Pub. Date Dec. 10, 1981

PCT Filed May 30, 1980, Ser. No. 341,983

Int. Cl.³ B02C *2/04*

U.S. Cl. 241—207 8 Claims



1. In a cone crusher including an adjustment ring and a support ring threaded thereto, the improvement comprising a clamp device including a check nut formed with an outwardly facing taper recess, said nut being threaded on said adjustment ring;

hydraulic cylinders having spring-actuated piston rods;

said rods having tips arranged in a groove, said rods being radially disposed relative to said nut; and

said groove having a surface delimited by said taper recess of said check nut, another surface of said groove being defined by the end surface of said support ring.

4,463,909

COP SUPPLYING SYSTEM IN AUTOMATIC WINDER

Masaharu Kiriake, and Akira Shimano, both of Kyoto, Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Apr. 5, 1982, Ser. No. 365,648

Claims priority, application Japan, Apr. 10, 1981, 56-54528; Sep. 30, 1981, 56-155540

Int. Cl.³ B65H *54/20, 67/02*

U.S. Cl. 242—35.5 A 8 Claims

1. In an automatic winder, for winding yarn from a cop to a package wherein said cop comprises yarn wound upon a bobbin, having a plurality of winding units, the improvement comprising a cop supply system consisting of: a device for carrying the cop, said device supporting the cop thereon by engaging said bobbin; conveyor means for transferring said device to each winding unit of the automatic winder; means for supplying the cop to the winding unit and for feeding a yarn from said cop to be wound, while retaining said cop on said device; and means for transferring said device carrying the unwound empty bobbin from the winding unit.

4,463,910

DEVICE FOR FORMING A STORAGE COIL FROM A THREAD SUPPLIED FROM A YARN SUPPLY

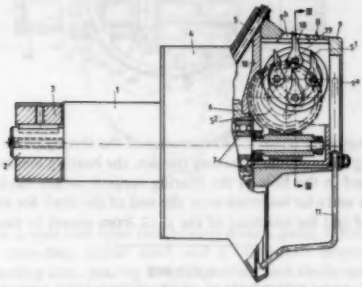
Hubert P. van Mullekom, Deurne, Netherlands, assignor to Ruti-te Strake B.V., Netherlands

Filed Oct. 6, 1982, Ser. No. 433,084

Claims priority, application Netherlands, Oct. 28, 1981, 8104882

Int. Cl.³ B65H *51/20*

U.S. Cl. 242—47.12 **2 Claims**



1. A device for forming a storage coil from a thread supplied from a yarn supply, said device comprising a winding drum having therein a drum chamber and having an axially extending aperture communicating with the interior of said chamber, a thread guide rotatable relative to said winding drum, a first disc rotatably mounted within said drum chamber about an axis extending approximately transverse to the direction of extent of the axis of said winding drum, a plurality of pins each carried by said first disc for rotation about an axis parallel to the axis of said first disc with the several axes of pin rotation being disposed on a first pitch circle so located that end portions of the pins may sequentially protrude through and recede from said aperture in said winding drum upon rotation of said first disc relative to said winding drum, a second disc rotatably mounted within said drum chamber for rotation about an axis eccentric to the axis of rotation of said first disc, means for rotating said second disc in timed relation to the rotation of said thread guide relative to said winding drum, a plurality of crank shafts corresponding in number to said pins, each of said crank shafts being rotatably carried by said second disc with the several axes of crank shaft rotation being disposed on a second pitch circle having the same diameter as said first pitch circle, and crank arms connecting said crank shafts to said pins with each crank arm being fixed at one end portion with respect to a crank shaft and fixed at an opposite end portion to a corresponding pin.

4,463,911

STRAP DISPENSER

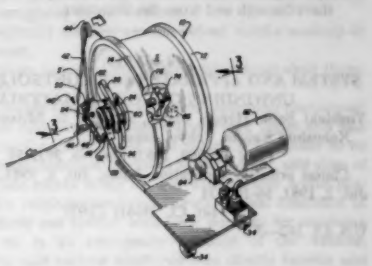
John R. Beach, Elmhurst, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Jun. 2, 1982, Ser. No. 384,219

Int. Cl.³ B65H *19/10*

U.S. Cl. 242—55.2 **3 Claims**

1. A strapping dispenser for dispensing strap axially from a reel of strap while correcting the twist caused by the axial removal of strapping from the reel, comprising: a frame, a reel assembly having a coil of strapping thereon, means for mounting the reel on said frame so that said reel may freely rotate about said mounting means, a freely rotatable shaft axially disposed within said mounting means, a strap feeder assembly secured to said shaft and constructed and arranged to rotate in one direction relative to said reel during strap removal in a non-tangential direction therefrom and outwardly generally along the axis of said shaft, means controlled by said shaft movement for connecting the strap feeder assembly to said reel and rotating the reel and strap feeder assembly in the opposite direction to untwist the strap previously twisted when being dispensed from the reel in a non-tangential direction through



the strap feeder assembly, said control means including switch means and a floating nut for controlling the operation of said switch means, which nut is free to move longitudinally on said shaft when said shaft is rotated by said strap feeder assembly.

4,463,912

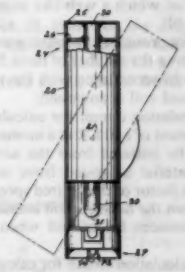
MULTI-ROLL DISPENSER

Orion L. Grunerud, 2615 Esquire Dr., Boise, Id. 83704

Filed Mar. 22, 1983, Ser. No. 477,628

Int. Cl.³ B65H *67/02, 19/04, 19/08*

U.S. Cl. 242—55.42 **17 Claims**



1. A dispenser for rolls of toilet tissue, paper, or other flexible roller materials wound upon a hollow roll core, comprising:

a mounting frame adapted for rigid attachment to a supporting surface;

a storage container connected to the mounting frame and having a top end and a substantially open bottom end; said storage container also having a side opening near the bottom end; the storage container serving to store a plurality of rolls therein in an end-to-end stack arrangement;

a core rod mounted to the storage container at the top end thereof and extending downwardly through the storage container in a cantilevered arrangement;

a pivot plate pivotally connected to the storage container and pivotable between a support position and a loading position; the pivot plate having a core opening therethrough which is approximately coaxially aligned with the core rod and sufficiently large to allow a roll core to pass therethrough;

a slide plate slidably connected to the pivot plate; the slide plate being positioned above the pivot plate and adjacent to the side opening in the storage container; the slide plate having a core aperture therethrough which is sufficiently large to allow a roll core to pass therethrough; the slide

plate being slidable between an offset position wherein the core aperture is offset with respect to the core rod and the core opening in the hinge plate, and a core discharge position wherein the core aperture is aligned with the core opening and core rod to allow a superposed core to drop therethrough and from the dispenser.

4,463,913

SYSTEM AND APPARATUS FOR CONTROLLING THE UNWINDING OF COILED MATERIAL

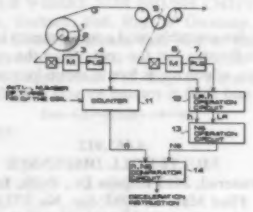
Yoshiaki Sato, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 23, 1982, Ser. No. 391,454

Claims priority, application Japan, Jul. 2, 1981, 56-104929; Jul. 2, 1981, 56-104931

Int. Cl.³ B65H *25/00*

U.S. Cl. 242—57 **4 Claims**



3. An apparatus for controlling the unwinding of coiled material comprising:

(a) a mandrel on which a web-like material is wound in the form of a coil;

(b) a counter for presetting an initial number of turns of a coil and subtracting the number of turns from said initial number of turns in accordance with the rotation of said mandrel when said coil is unwound;

(c) a first calculation circuit for calculating the desired remaining amount of coil LR at a moment when the deceleration is to be initiated from the actual speed V of the web-like material unwound from said mandrel, the set deceleration factor α, the desired speed Vo of the web-like material when the deceleration is finished and the desired remaining amount Ld of coil when the deceleration is finished;

(d) a second calculation circuit for calculating the number of revolutions Ns of said mandrel corresponding to the output LR derived from said first calculation circuit; and

(e) a comparator for comparing the output of said counter with the output of said second calculation circuit, and releasing deceleration instructions at the deceleration factor α to said mandrel when said both outputs are in coincidence with each other.

4,463,914

DUAL MOUNTED BEARINGS FOR FISHING REEL

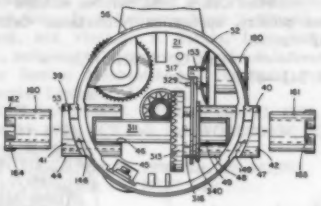
John W. Puryear, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jan. 17, 1980, Ser. No. 112,913

Int. Cl.³ A01K *89/01*

U.S. Cl. 242—84.1 J **11 Claims**

8. A fishing reel having a gear crank assembly with a shaft having an outer diameter, a housing with a deck plate, a pair of bearing support means for mounting the shaft of the gear crank assembly, the bearing support means being mounted to the rear of said deck plate in spaced apart relation, each bearing support means having a through hole with the holes being in axial alignment transversely of the reel, a slot in the wall of at least one of the bearing support means opening in a direction other than toward the deck plate, the slot being defined by walls spaced apart by an amount greater than the diameter of the shaft to permit transverse movement of the shaft into a position of alignment with the holes, the diameter of the through hole connected to the slot is at least equal to the space between the walls of the slot, and bearing means having an outer diameter



approximately equal to the diameter of the through hole in the bearing support means having the slot, the bearing means being mounted in the hole in the bearing support means having the slot by endwise insertion over the end of the shaft for support thereof and for blocking of the shaft from access to the slot.

4,463,915

BAIL ARM REVERSING STRUCTURE FOR SPINNING REELS FOR FISHING

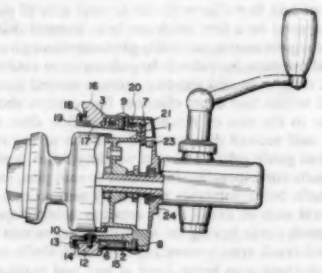
Kyoichi Kaneko, Tokyo, Japan, assignor to Daiwa Seiko Inc., Higashikurume, Japan

Filed May 17, 1982, Ser. No. 378,816

Claims priority, application Japan, May 29, 1981, 56-78560[U]

Int. Cl.³ A01K *89/01*

U.S. Cl. 242—84.2 G **2 Claims**



1. A bail arm reversing structure for spinning reels for fishing, having a rotor, bail arm mounting elements formed at both sides of and integrally with said rotor, a bail arm adapted to engage a fishing line therewith and fastened to said mounting elements, a dead point spring urging said bail arm to move the latter from a dead point of the former to a fishing line rewinding position and a fishing line releasing position, and a bail arm returning means comprising bail arm support members to which said bail arm is fixedly joined, shaft portions formed at ends of said bail arm support members, bearing bores formed in bottom portions of said bail arm mounting elements and adapted to fit said shaft portions therein in such a manner that said shaft portions can be moved pivotally therein, and flange-like projections formed at base sections of, normal to, and integrally with, said shaft portions, said bail arm support members being recessed entirely within, and supported at, the inner side surfaces of the bottom portions of said bail arm mounting elements, and inner surfaces of cover plates fitted from the outside in said bail arm mounting elements.

4,463,916

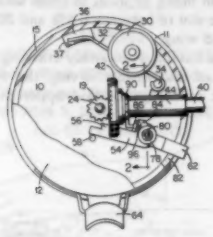
SILENT AND SELECTIVE ANTI-REVERSE MECHANISM

John W. Puryear, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 342,078, Jan. 25, 1982, abandoned. This application Jun. 16, 1983, Ser. No. 503,647

Int. Cl.³ A01K *89/01*

U.S. Cl. 242—84.2 A **12 Claims**



1. In a spin cast type reel having a deck plate, a longitudinally extending center shaft and a crankshaft disposed on intersecting axes, gearing interconnecting said shafts including a pinion gear on the center shaft and a meshing face gear on an end of the crankshaft, the improvement comprising:

an anti-reverse device pivotally connected with a part of said reel for rotation about a substantially longitudinally extending axis and having a substantially flat body portion, a tab integral with and extending transversely to the plane of the flat body portion and an elongate slot in said tab;

an actuator for pivoting said anti-reverse device, said actuator including a flat C-shaped part which partially surrounds and frictionally clamps around the crankshaft intermediate the ends of the crankshaft, an arm extending radially from the flat C-shaped part and a connecting end extending from said arm transversely to the plane of the flat C-shaped part;

said connecting end received in said elongate slot whereby movement of said actuator causes pivoting of said anti-reverse device.

4,463,917

WEBBING RETRACTOR

Shinji Mori; Akinori Fujiwara, and Takashi Kawaharazaki, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Jul. 28, 1982, Ser. No. 402,583

Claims priority, application Japan, Aug. 12, 1981, 56-119452[U]; Sep. 14, 1981, 56-136645[U]

Int. Cl.³ A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.4 A **11 Claims**

1. A webbing retractor used in a seatbelt system for protecting an occupant in an emergency situation of a vehicle for winding an occupant restraining webbing, comprising:

(a) a frame secured to a vehicle body;

(b) a takeup shaft pivotally supported on said frame for winding one end of said occupant restraining webbing;

(c) a lock ring supported coaxially with said takeup shaft and adapted to generate a lag in rotation from said takeup shaft in an emergency of the vehicle;

(d) an internally toothed ratchet wheel solidly secured to said frame;

(e) lock plates provided for holding said takeup shaft therebetween;

(f) guide means comprising slots and projecting pins engaging with said slots provided on said lock plates and said lock ring for guiding said lock plates in a manner to be movable in directions opposite to each other, said slots of said guide means being formed with narrow width portions for receiving said pins during normal condition of the vehicle and further with wide portions for receiving said pins in an emergency situation of the vehicle, whereby said narrow width portions closely receive said pins to eliminate gaps in said lock plates and said wide portions loosely receive said pins to prevent said pins from being damaged; and

(g) engageable means adapted to be subjected to a turning force of said takeup shaft to drive said lock plates in directions opposite to each other when said takeup shaft and said lock ring move relative to each other, whereby said lock plates are pushed against and meshed with said internally toothed ratchet wheel, so that the webbing unwinding rotation of said takeup shaft can be stopped.

4,463,918

MAGNETIC RECORDING TAPE CARTRIDGE

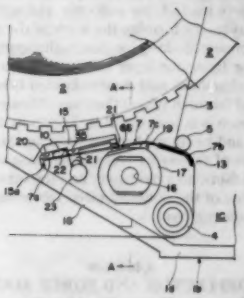
Hiroyoshi Takagi, Kameoka, Japan, assignor to Hitachi Maxell, Ltd., Osaka, Japan

Filed Oct. 28, 1981, Ser. No. 315,859

Claims priority, application Japan, Oct. 31, 1980, 55-156708[U]

Int. Cl.³ G11B *15/43, 23/04*; B65H *23/10*

U.S. Cl. 242—199 **10 Claims**



1. A magnetic recording tape cartridge comprising:

a bottom shell and a top shell assembled together to provide a cartridge case;

a magnetic recording tape directed along a predetermined path having two ends wound around a pair of tape reels accommodated in said cartridge case, each of said ends of said recording tape being engaged with said tape reels, said tape having an intermediate portion;

a pair of first tape guide members vertically provided on the upper surface of said bottom shell in positions near the front face of said cartridge case for guiding said magnetic recording tape;

a tape adjusting member comprising a resilient plate having a main portion with a free end provided to contact said magnetic recording tape; and

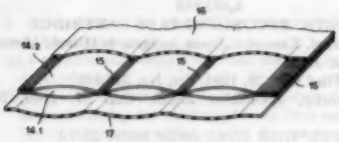
a pair of first and second opposing supporting wall members formed on said bottom shell having a gap defined therebetween, said first wall member having a step portion defining a lower portion and upper portion in said wall member directed toward said gap, said gap being provided to removably receive said main plate portion of said tape adjusting member with a vertical attitude, said free end of said tape adjusting member being situated so as to press said magnetic recording tape against one of said first tape guide members, said tape adjusting member being provided with a raised tongue portion projected from said main plate portion of said tape adjusting member toward said wall member having said step portion provided therein, said raised tongue portion being engaged with a face of the lower portion of said step portion of said wall member when said tape adjusting member is in position between said wall members, with one vertical edge of said tongue member being engaged with a corresponding vertical face of said upper portion of said step portion of the respective wall member, thereby securing said tape adjusting member in said tape cartridge.

4,463,919

PNEUMATIC DEICERS FOR AIRCRAFT

Jean-Claude Bac, Le Petit Couronne, France, assignor to Caoutchouc Manufacture et Plastiques, Levallois-Perret, France

Filed Jun. 3, 1982, Ser. No. 384,517
Claims priority, application France, Jun. 3, 1981, 81 10980
Int. Cl.³ B64D *15/18*
U.S. Cl. 244—134 A **6 Claims**



1. A pneumatic deicer which comprises multiple, inflatable, tubular chambers made from a double knitted fabric having two separate layers for forming the walls of the chambers, said layers being connected along longitudinally spaced linear areas by interknitting from one layer to the other to delimit juxtaposed tubular chambers, said double-knitted fabric comprising a Jersey knitted fabric in which the ratio of transverse to longitudinal elongation is at least equal to 2 to allow the inflation of the chambers and being rubberized on outer faces of each of said layers; one of the layers being bonded on one side of the double-knitted fabric to a base layer and the other of the layers on the other side of the double-knitted fabric being bonded to a rubberized coating layer.

4,463,920

THRUST DEFLECTOR AND FORCE AUGMENTOR

James H. Nichols, Jr., Hyattsville, Md.; Roger J. Furey, Vienna, Va.; Robert J. Englar, Derwood, Md., and David G. Lee, Reston, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 238,264, Feb. 25, 1981, Pat. No. 4,398,687. This application Nov. 29, 1982, Ser. No. 445,325
The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.
Int. Cl.³ B64C *21/04*
U.S. Cl. 244—207 **4 Claims**

1. A thrust deflection, thrust reversal and force augmentation device for an aircraft capable of short takeoff and landing, and vertical takeoff and landing, comprising;

an aircraft wing;

a thrust engine mounted on said wing with the exhaust from said engine traveling over the upper surface of said wing;

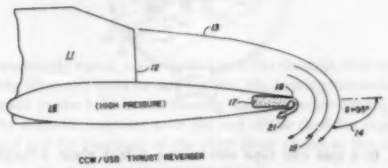
a plenum inside said wing having an inlet connected to a source of gas pressure and an outlet in the trailing edge of said wing;

said outlet being formed as a slot means between an upper portion and a lower portion;

said upper portion being a part of the upper surface of said wing and having a reduced thickness near the rear edge;

said lower portion forming the rear wall of the plenum, the lower edge of the slot and the rear edge of said wing, said lower portion being eliptical in cross section and having an axis at the slot of between 0.5% and 20% of the chord length of said wing;

said slot means having a smoothly converging nozzle with the portion of said nozzle having the minimum height being at the rear edge of said upper portion, said slot



means having a height of between 0.8% and 10% of said axis at the slot;

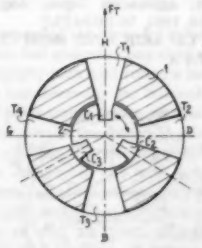
wherein gas from said source of gas pressure is controlled to travel through said plenum, escape through said converging nozzle and slot means and travel along the rear edge of said wing so as to cause said exhaust to be selectively deflected downwardly at an angle between 90° and 165° with the deflected exhaust retaining a substantial portion of the orignal thrust at angles of between 0° and 165°, so that the deflected exhaust acts substantially to slow down and lift the aircraft, allowing a short takeoff and landing capability for deflections less than 90° vertical takeoff and landing capability for deflections near 90° and thrust reversing capability to increase braking force at deflections greater than 90°.

4,463,921

GAS JET STEERING DEVICE AND METHOD MISSILE COMPRISING SUCH A DEVICE

Pierre Metz, Paris, France, assignor to Thomson-Brandt, Paris, France

Filed Apr. 20, 1982, Ser. No. 370,100
Claims priority, application France, Apr. 21, 1981, 81 07915
Int. Cl.³ F42B *15/02*
U.S. Cl. 244—3.22 **12 Claims**



1. A gas jet steering device for a guided missile, said get jet steering device comprising:

(a) an annular element having a plurality N of equi-angularly spaced fixed exhaust nozzles inclined at and angle α to the longitudinal axis of the guided missile;

(b) a rotary switching element disposed coaxially inside said

annular element, said rotary switching element having a plurality M of gas flow passageways terminating in equiangularly spaced outlets located in position to communicate with the inlets of said fixed nozzles, the integers M and N being different from one another; and

(c) positioning means for rotating said rotary switch elements so as to selectively open and close communication between each of said M gas flow passageways and said N fixed nozzles, thereby steering the guided missile.

4,463,922

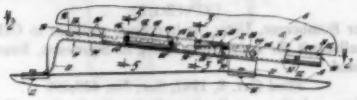
SEAT SLIDE STRUCTURE

Richard W. A. Rees, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 5, 1983, Ser. No. 491,777

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—429 **3 Claims**



3. A seat slide structure comprising, in combination, a first generally U-shaped track member having a base and a leg extending laterally from each side of the base, the legs including spaced pairs of transversely aligned elongated slots,

a second generally U-shaped track member including a base and a leg extending laterally from each side of the base, the base and legs of the second track member being juxtaposed to the base and respective legs of the first track member,

slide means slidably supporting the first track member on the second track member,

the second track member being provided with a longitudinal series of pairs of locking notches in the legs thereof,

a latch member located within the first track member and including spaced pairs of oppositely extending locking and pivot portions, the locking portions extending outwardly of one pair of elongated slots of the first track member to longitudinally locate the latch member within the first track member, the pivot portions extending outwardly of a second pair of elongated slots of the first track member to pivot the latch member to the first track member for movement between a locked position wherein the locking portions are received within a pair of locking notches of the second track member to lock the first and second track members to each other, and a released position wherein the locking portions are out of engagement with any pair of locking notches to permit relative movement of the first and second track members,

spring means biasing the latch member toward locked position,

and means for moving the latch member to released position.

4,463,923

HANGER ASSEMBLY

Kenneth H. Refker, 22 Lake Shore Dr., Shalimar, Fla. 32579

Filed Jul. 23, 1982, Ser. No. 401,138

Int. Cl.³ F16M *13/00*

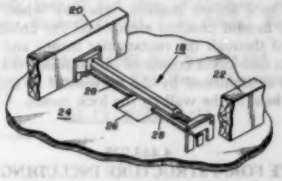
U.S. Cl. 248—546 **12 Claims**

1. An expansible load-bearing junction box hanger assembly adapted for installation from beneath the ceiling and through a junction box aperture in the ceiling without requiring complete removal of the previously installed light-weight hanger assembly over which it is installed comprising:

(a) a pair of spaced joist engaging means for interengaging two spaced adjoining ceiling joists in a sustained high-pressure load-bearing engagement to support a heavy vertical load,

(b) elongated linearly expanding brace means which is aligned with and connected between the joist engaging means for readily expanding from a short to a longer length to bring each of the joist engaging means into forced pressure contact with their respective joist surfaces for all points along its length of expansion through an outward force substantially greater than the operative force applied thereto and for providing a strong non-flexing space with high vertical load-bearing capability,

(c) a support means connected to each of the joist engaging means which rests on and rides along the upper surface of the ceiling for supporting the interconnecting brace means above and in parallel alignment clear of the non-removed



end portions of the previously installed light-weight hanger assembly during and after final expansion of the brace means and for also providing vertical load bearing capability,

(d) a junction box supported on the central section of the expansible brace means, and

(e) junction box connecting means rigidly connected to the brace means for firmly and rigidly connecting the junction box in solid engagement with the brace assembly and for providing a two axis twist-resistant mechanical connection for supporting a heavy rotatable unit electrically powered through the junction box.

4,463,924

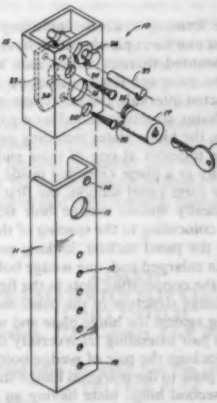
PICTURE LOCKING AND STRAIGHTENING DEVICE

Mario W. Conti, 7616-A El Camino Real, Carlsbad, Calif. 92008

Filed Sep. 13, 1982, Ser. No. 417,224

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—553 **10 Claims**



1. A lockable picture hanging and straightening device comprising:

a channel member having means for attachment to the frame of a picture, said channel member having an opening therethrough for passage of a lock means;

a rectangular member having holes for attachment to a wall

and having an opening in the side of the rectangular member which is furthest from the side which is attached to the wall, said rectangular member having means for affixing lock means thereto and further having inside dimensions sufficient to permit the passage of the channel member therethrough;

lock means having an outside dimension such that it fits and passess through the openings in the rectangular member and in the channel member and into the means for affixing so that the channel member is locked to the rectangular member when the lock means is inserted through the rectangular member and the channel member;

reel means attached to said rectangular member, said reel means having means for attachment of a line means and further having means for adjusting the length of the line means in a secure manner, whereby when a picture is affixed to said channel means and the channel means is inserted through the rectangular means and a line is affixed to one lower corner of the painting, that the picture can be straightened by the movement of the reel means and is held to the wall by the lock means.

4,463,925

CONCRETE FORM STRUCTURE INCLUDING ONE-WAY ESCAPE HINGE

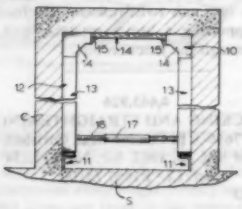
Vernon R. Schimmel, Lincolnwood, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed Jul. 2, 1982, Ser. No. 393,613

The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.

Int. Cl.³ E04G *15/06*; B28B *7/30*

U.S. Cl. 249—11 **16 Claims**



1. In a concrete forming structure including a collapsible form having at least one form panel section having a marginal flange structure mounted thereon at one side and vertically spaced slots on the marginal flange structure for receiving wedge bolts at selected intervals, the improvement comprising a one-way escape hinge structure including a pair of first and second hinge plates, the hinge plates including an escape hinge securing said plates together at one of their ends, the escape hinge lying generally in a plane extended inside of an outside forming face of the form panel section, the first of said hinge plates having vertically spaced wedge bolt slots spaced at intervals generally coinciding to the spacing of the slots on the marginal flange of the panel section, locking pairs of wedge bolts each having an enlarged end, one wedge bolt of each pair extending through the cooperating slots in the first hinge plate and the marginal flange structure of the panel section with its enlarged end resting against the hinge plate and with the other wedge bolt of each pair extending transversely through a slot in the wedge bolt locking the pair of wedge bolts in assembly to secure the hinge plate to the marginal flange structure of the panel section, the second hinge plate having an angle, means securing one angle leg of the angle in assembly with the second hinge plate, the second hinge plate having spaced clearance slots each alignable with one of the slots in the first hinge plate and the enlarged end of the wedge bolt extending through the second hinge plate for allowing the hinge plates to be positioned in parallel relation to one another, the angle including a second load bearing angle leg being constructed and sized so as to provide sole load bearing strength in the vertical direction when in load bearing ground engagement when in a pour position and lying in the same plane of the forming face of the associated form panel section and with both angle legs and said second hinge plate swingable together on said escape hinge freeing the second angle leg from an engaged position to an escape position thus allowing the collapsible form to be freed and moved to a new position for a subsequent pour, the second leg of said angle being continuous to provide rigidity and to enable the second leg to provide a concrete seal and to act as part of the mold without recourse to any bracing means, and a spacer pad mounted on one of the hinge plates for holding the hinge plates apart and having a thickness sufficient to allow the hinge plates to be positioned in generally parallel relationship without interference from the enlarged ends of the wedge bolts extending through said first hinge plate.

4,463,926

ASSEMBLY OF CASING ELEMENTS FOR POURING OF CONCRETE

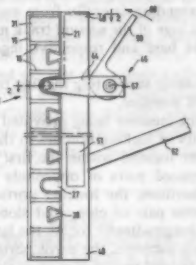
Werner Bomberger, Uster, Switzerland, assignor to GIBA AG Gesellschaft für Industrialisierung in Bauwesen, Baar, Switzerland

Filed Oct. 8, 1982, Ser. No. 433,398

Claims priority, application Switzerland, Oct. 19, 1981, 6,661/81

Int. Cl.³ E04G *11/06*

U.S. Cl. 249—47 **13 Claims**



1. A form of assembled elements for pouring concrete, comprising, in combination:

(a) a plurality of panels of synthetic material, each including:

1. a hollow envelope of hard and flexible material with
   (i) a molding face corresponding to the shape to be given to the wall, the said face being composed of elastomer,
   (ii) reinforcements, preferably of steel, inserted in the edges of the panels,
   (iii) a rear face;
2. within the envelope a filler of rigid foam of synthetic material that is compatible with and adheres firmly to the envelope;
3. edges including a reinforced lip and attachment points for assembly means;

(b) reinforcing means including metallic sections located at the junctions between pairs of panels;

(c) a support scaffold in the form of a triangular trellis conforming at the rear of the form to the metallic sections of the reinforcing means;

(d) assembly means for the panels, the reinforcing means and the support scaffold for simultaneously holding all together;

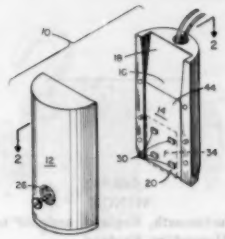
each of the elements of the assembly, namely the panels, the reinforcing framework and the scaffold, having separately a size and a weight which renders them easily manipulable by a single man.

4,463,927

APPARATUS FOR SECTIONING DEMOUNTABLE SEMICONDUCTOR SAMPLES

Bhushan L. Sopori, Scottsdale, and Abraham Wolf, Sun City West, both of Ariz., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 24, 1983, Ser. No. 469,350
Int. Cl.³ B24B *41/06*; B22D *19/04*; B25B *11/00*
U.S. Cl. 249—95 14 Claims



1. An apparatus for securing and aligning a ribbon-like sample during polishing, comprising:

a hollow body portion having an elongated sample cavity disposed therein, said cavity terminating in end sections which communicate with outside surfaces of said body portion;

said body portion defining a first opening at a first end of said sample cavity;

said body portion defining a second opening adjacent said second end of said sample cavity;

sample engaging means located adjacent said second end of said sample cavity for releasably engaging said sample;

directing means formed in said body portion and located adjacent said first end of said sample cavity for directing a chemically inert, selectively softenable molding medium to portions of said sample cavity adjacent said second end thereof; and

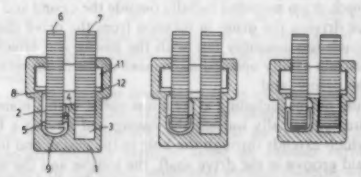
softening means in contact with said body portion for selectively softening said molding medium after a polishing operation whereby said molding medium is drained from said sample cavity.

4,463,928

CLAMP REGULATOR FOR TRANSFUSING LIQUID AND BLOOD

Shiro Ueda, 156, Fu Hsing North Rd., Taipei, Taiwan

Filed Jul. 23, 1982, Ser. No. 401,307
Int. Cl.³ F16L *55/14*
U.S. Cl. 251—6 2 Claims



1. A clamp regulator for controlling liquid flow through a flexible tubing comprising:

a clamp frame having a first groove and a second groove, both extending longitudinally along the frame and having an inclined bottom to form deep and shallow ends, respectively, the first groove being provided with two guided protuberances and having a cross sectional area which increases from the deep to the shallow end;

an adjustable wheel slidably mounted into the clamp frame in such a way that the lower part of the wheel is positioned in the first groove, the adjustable wheel being adapted to engage the guided protuberances in the first groove to allow the wheel to move along the center line of the first groove; and

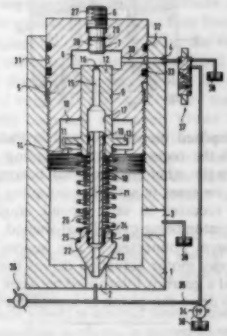
an auxiliary wheel slidably mounted into the clamp frame in such a manner that the lower part of the wheel is located in the second groove, the auxiliary wheel being connected integrally to the adjustable wheel by an axle.

4,463,929

PRESSURE RESPONSIVE VALVE

Joerg Dantlgraber, Lohr-Sackenbach, and Albert Mueller, Achaffenburg, both of Fed. Rep. of Germany, assignors to Mannesmann Rexroth GmbH, Lohr (Main), Fed. Rep. of Germany

Filed Feb. 24, 1982, Ser. No. 351,885
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1981, 3107775
Int. Cl.³ F16K *31/12*
U.S. Cl. 251—44 6 Claims



1. A pressure valve of the type having a valve member, valve spring means for urging the valve member toward a valve seat at a pressure opening, a control piston coaxially movable relative to the valve member, and means defining a connection passage having a throttle point therein, the passage extending from the pressure side of the valve member to the control side of the control piston, the improvement wherein

said valve spring means extends between and acts on the valve member and the control piston; and

said valve member and control piston are dimensioned such that the pressure responsive surface on the pressure side of the valve member is smaller than the pressure responsive surface of the control piston in fluid communication with said surface of said valve member through said connection passage.

4,463,930

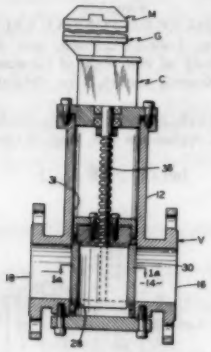
PISTON-TYPE VALVE WITH SLIP CLUTCH ACTUATED LIMIT SWITCH

Michael Vamvakas, 2739 Country Club Blvd., Rocky River, Ohio 44116

Filed May 20, 1982, Ser. No. 380,040
Int. Cl.³ F16K *31/04*
U.S. Cl. 251—134 1 Claim

1. A piston-type valve comprising; a valve body having a horizontally disposed fluid flow passageway, a valve piston operatively mounted in said body for vertical movement therein to selectively close and open said passageway, an electric motor operatively connected to said piston to vertically move the same, a slip clutch operatively interposed between

the motor and the piston whereby clutch slippage is effected when the piston encounters a predetermined resistance in its vertical movement, a limit switch operatively connected to the clutch for triggering by clutch slippage, said limit switch also being electrically connected to the motor, whereby when the piston encounters a predetermined resistance in its vertical movement resultant clutch slippage triggers the limit switch to stop the motor, said slip clutch including first and second couplings, bias means urging said couplings together in mated relation, each coupling having a plurality of coacting circumferentially disposed recesses formed in their opposed mating surfaces with the recesses in one coupling disposed opposite the recesses in the other coupling, ball bearings disposed in said recesses, the recesses in said first coupling being cylindrical-shaped, the recesses in said second coupling being cone-shaped, said piston being cylindrical-shaped, said piston having a threaded stem connected to the second coupling of the clutch, whereby motor actuation drives the piston to operate the valve, and a gearbox interposed between the motor and the slip clutch to drive the piston at a predetermined speed.



4,463,931

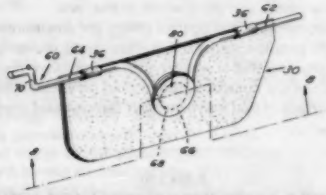
DAMPER DEVICE AND METHOD OF FORMING

Walter P. Baughman, Livonia, Mich., assignor to Plastomer Corporation, Livonia, Mich.

Filed Sep. 8, 1981, Ser. No. 299,782

Int. Cl.³ F16K *1/22*

U.S. Cl. 251—298 **5 Claims**



1. A damper plate assembly which comprises:

(a) a plate shaped to serve as a closure for an opening in an air passage to be pivotally mounted on an axis substantially in the plane of said plate and having longitudinal edges essentially parallel to said axis,

(b) spaced clips symmetrically disposed on said plate having an opening in one direction toward a common edge of said plate to receive aligned opposite ends of a mounting shaft on said axis,

(c) a mounting shaft having opposite aligned ends received in and secured by said clips to said plate and formed with a loop overlying said plate, the bight of the loop being spaced laterally on said plate from said clips and said axis, the open side of the loop being open in the direction of said common edge, and

(d) an insertable button retainer on said plate for said mounting shaft having a head flange to overlie each side run of said loop and a shank to interfit with the bight of said loop between said side runs, said plate having a perforation to receive the shank for holding said button retainer on said plate, said clips and said button cooperating to lock the shaft in three dimensions on said plate against longitudinal and lateral motion on said plate and motion away from the plane of the plate.

4,463,932

WINCH

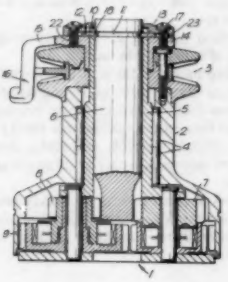
Brian Shuker, Portsmouth, England, assignor to Lewmar Marine Limited, Hampshire, England

Filed May 11, 1983, Ser. No. 493,596

Claims priority, application United Kingdom, Oct. 8, 1982, 8228815

Int. Cl.³ B66D *1/30*; F16B *21/00*

U.S. Cl. 254—266 **7 Claims**



1. A manually powered marine winch having:

a casing with a generally cylindrical wall, the axis of the cylinder being generally vertical in use, the wall having a hole therein;

a rotatable drive shaft located radially within the casing and extending axially thereof and having a continuous circumferential groove;

a winch drum mounted radially outside the casing and means for driving the drum in rotation from the drive shaft;

a winch top assembly fast with the casing and effective to restrain axially upward movement of the drum relative to the casing; and

keying means including at least one collet with a main body situated radially outside the casing and having a tongue which extends through the hole in the casing and into the said groove in the drive shaft, the tongue and the sides of the hole co-acting to restrain the collet from axial and circumferential movement, and the collet and drive shaft fixing the drive shaft axially relative to the casing;

the winch top assembly including a winch top cap and restraining means interactable with the main body of the collet effective to restrain the collet from radially outward movement, the collet and the winch top assembly fixing the winch top assembly axially and rotationally relative to the casing.

4,463,933

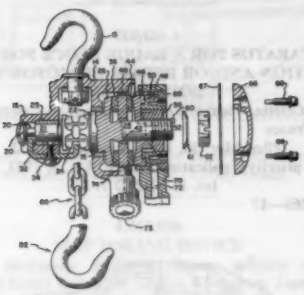
CLUTCH/BRAKE MECHANISM

Kenneth D. Schreyer, Clarence, and Alton H. Cooper, Kenmore, both of N.Y., assignors to Columbus McKinnon Corporation, Amherst, N.Y.

Division of Ser. No. 210,178, Nov. 25, 1980, abandoned. This application Oct. 27, 1982, Ser. No. 437,131

Int. Cl.³ B66D 3/02

U.S. Cl. 254—368 2 Claims



1. In a lever-operated ratchet type load puller, comprising a frame having a support hook extending therefrom and a power shaft rotatably mounted in said frame and carrying a load engaging wheel thereon for load pulling and load tensioning, and hoisting and lowering operations in response to reverse rotations of said shaft; a manually operable lever rotatably mounted upon said frame to extend laterally therefrom and a cam-actuated clutch-brake means operative to intermittently interconnect said lever and said power shaft whereby said lever may be rotatably maneuvered in opposite directions for alternately pulling and releasing a load, and whereby such clutch-brake means operates to hold said power shaft against rotation intermediately of maneuvering operations of said lever; said clutch-brake means including oppositely paired relatively rotatable friction members having opposed friction surfaces which are alternately pressed together and released in response, respectively, to the application and removal of axial forces initiated by said alternate lever movements, the improvement comprising:

at least one of said opposed friction surfaces being of substantially frusto-conical configuration and the other of said opposed friction surfaces being of substantially planar configuration and so arranged that said friction surfaces maintain peripheral sealing contact when released to prevent ingress of external debris to the clutch-brake mechanism;

one of said opposed friction surfaces includes annular surface areas adjacent the outer peripheral surface thereof that dig into and are overlapped by the other of said opposed friction surfaces along an annular surface inwardly of the outer peripheral surface thereof, whereby an annular peripheral portion of said other peripheral surface overlaps and sealingly abuts said one of said opposed friction surfaces to thereby prevent ingress of dirt between said opposed friction surfaces; and

spring means of sufficient force to constantly maintain said peripheral sealing contact but of insufficient force to prevent release of said friction surfaces upon removal of said axial forces.

4,463,934

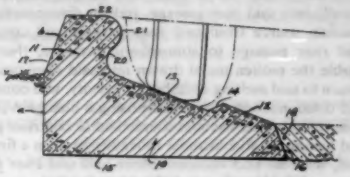
SAFETY BARRIERS FOR HIGHWAYS AND THE LIKE

Pedro S. Ochoa, and Pedro S. Cortes, both of Av. M. Gutierrez Zamora No. 88, Mexico 20, D.F., Mexico

Continuation-in-part of Ser. No. 149,674, May 14, 1980, abandoned. This application Jul. 28, 1982, Ser. No. 402,614

Int. Cl.³ A01K 3/00

U.S. Cl. 256—13.1 15 Claims



1. A vehicle safety barrier for the encounter of a vehicle wheel to control steering and rebound of said vehicle and including;

an elongated horizontally disposed footing comprised of a shoulder having inner and outer surfaces inclined upwardly and outwardly from an inner face fixedly joined to the pavement surface of the roadway, the outer inclined surface being offset below the inner inclined surface with an outwardly disposed step face joining the two,

and an elongated vertically disposed barrier wall comprised of an inwardly disposed concaved lower face portion continuation of the outer surface of the footing shoulder and an inwardly disposed convex upper face portion continuation of said lower face portion, the barrier wall having a top face substantially coincidental with the axle height of the vehicle,

the step face of the footing shoulder and the upper face portion of the barrier wall being in spaced opposition a distance substantially greater than the width of a tire tread of the vehicle wheel,

whereby a vehicle wheel is steered toward the roadway by the inclined shoulder surfaces, is caused to rebound in the event of impact with the barrier wall, and return from the outer shoulder surface restricted by the step face, for regained control of the vehicle by a driver thereof.

4,463,935

MOLTEN METAL STIRRING EQUIPMENT

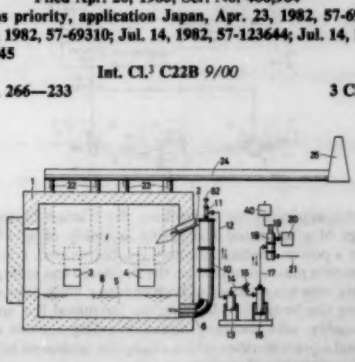
Tadao Yonekawa, Hyogo, Japan, assignor to Shinmei Engineering Company Limited, Hyogo, Japan

Filed Apr. 20, 1983, Ser. No. 486,964

Claims priority, application Japan, Apr. 23, 1982, 57-69309; Apr. 23, 1982, 57-69310; Jul. 14, 1982, 57-123644; Jul. 14, 1982, 57-123645

Int. Cl.³ C22B 9/00

U.S. Cl. 266—233 3 Claims



1. In a melting furnace of the type including a melting chamber for melting therein metal to form molten metal, and means

for discharging exhaust gases from said melting chamber, the improvement comprising:

a riser extending upwardly from said furnace and having a riser passage connected to said melting chamber at a level beneath the surface of the molten metal therein;

a vacuum source;

means for selectively connecting said vacuum source to said riser passage, thereby to reduce the pressure therein and to draw molten metal from said melting chamber upwardly into said riser passage, and for disconnecting said vacuum source from said riser passage and connecting said riser passage to atmospheric pressure, thereby to enable the molten metal drawn into said riser passage to return to said melting chamber by gravity, said connecting and disconnecting means comprising a changeover valve connected to said vacuum source and to said riser passage and having a valve member movable between a first position, whereat said vacuum source and said riser passage are connected, and a second position, whereat said vacuum source and said riser passage are disconnected;

means for, when said riser passage is connected to atmospheric pressure, preventing oxidation of the molten metal returning from said riser passage to said melting chamber, and thereby for preventing clogging of said riser passage by oxides of the metal, said preventing means comprising a duct connected to said exhaust gas discharging means and to said changeover valve at a position such that when said valve member is in said second position thereof the exhaust gases pass through said duct and said changeover valve to said riser passage;

fluid pressure operated means for controlling movement of said valve member between said first and second positions thereof; and

electric heating means for heating said riser at least at the vicinity of the position thereof which is reached by the molten metal drawn into said riser passage.

4,463,936

APPARATUS FOR CONTROLLING FRICTION BETWEEN THE LEAF SPRINGS OF A LAMINATED LEAF SPRING ASSEMBLY OF A VEHICLE

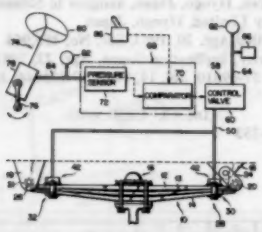
Takeyoshi Shinbori, Yokosuka; Ichiro Takadera, Tokyo, and Takeo Fukumura, Yokohama, all of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Sep. 7, 1982, Ser. No. 415,344

Claims priority, application Japan, Jan. 28, 1982, 57-12341

Int. Cl.³ B60G *11/02*; B62D *5/06*

U.S. Cl. 267—36 A **3 Claims**



1. An apparatus for controlling the friction between leaf springs of a laminated leaf spring assembly of a vehicle, in which a power steering assembly is incorporated, comprising:

clamping means mounted on the laminated leaf spring assembly which is attached at both ends to a body, thus supporting the body, for clamping the laminated leaf spring assembly, said clamping means including a guide member and a press member which clamp the laminated leaf spring assembly therebetween;

hydraulic cylinder means for pressing said press member to thereby urge said laminated leaf spring assembly against said guide member, said hydraulic cylinder means including a cylinder;

hydraulic controlling means including a control valve for controlling the pressure of compressed oil supplied to said cylinder of said hydraulic cylinder means; and

detecting means including a pressure sensor for sensing the pressure of the compressed oil acting on said power steering assembly and a comparator for comparing a signal from said pressure sensor with a predetermined value and for supplying a signal corresponding to the sensed pressure to said control valve when the sensed pressure exceeds the predetermined value.

4,463,937

APPARATUS FOR A GAUGE BLOCK FOR THE INSPECTION AND/OR REPAIR OF MOTOR VEHICLE BODYWORKS

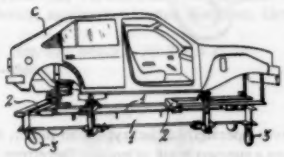
Germain Celette, Vienne, France, assignor to Celette S.A., Vienne, France

Filed Mar. 30, 1982, Ser. No. 363,433

Claims priority, application France, Apr. 3, 1981, 81 06733

Int. Cl.³ B21D *1/12*

U.S. Cl. 269—17 **9 Claims**



1. Apparatus for a gauge block for the inspection and/or repair of automobile vehicle bodyworks, for the easy positioning of such a bodywork on a gauge block having two parallel longitudinal flanged members, comprising:

(a) two cross members for disposition beneath these longitudinal members,

(b) rollers carrying said cross members for movement along said longitudinal members rolling on a flange thereof,

(c) a lateral bracket mounted at each of the extremities of the cross members at the exterior of the gauge block,

(d) sliding vertical arms extending from the upper extremity of said brackets respectively,

(e) an element carried by each arm adapted to support the base of a bodywork, said element being mounted movably in the transverse direction, and

(f) control means for the vertical arms for adjusting the position thereof in the vertical direction.

4,463,938

INTERNAL CLAMPING OF PIPES

Timothy C. Dearman, P.O. Box 937, Pearland, Tex. 77581

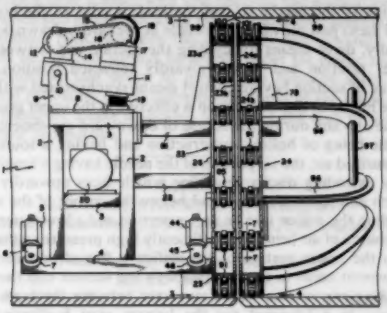
Filed Mar. 29, 1982, Ser. No. 362,908

Int. Cl.³ B23Q *3/14*

U.S. Cl. 269—48.1 **23 Claims**

1. Internal pipe clamping apparatus for aligning end to end a pair of confronting pipe lengths extending in prolongation of one another, said apparatus comprising first radially expansible and contractile clamp means; second radially expansible and contractile clamp means; means coupling said first and second clamp means to one another for relative transverse movement therebetween; independently operable first and second power means for radially expanding and contracting said first and second clamp means, each of said clamp means being of such diameter when contracted as to be accommodated within said pipe lengths and each of said clamp means being expansible

into engagement with the inner surface of the associated pipe length; and power shifting means acting on at least one of said



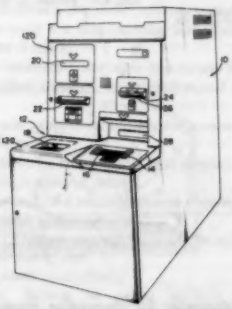
clamp means for effecting relative bodily transverse movements between said first and second clamp means.

4,463,939

SLIP ISSUING DEVICE

Yoshihiro Watanabe, Fujisawa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Jul. 8, 1982, Ser. No. 396,371
Claims priority, application Japan, Jul. 10, 1981, 56-107695
Int. Cl.³ B41F *13/54*
U.S. Cl. 270—1.1 **23 Claims**



1. A slip issuing device which has a string of slips separable from each other and each having a receipt and a journal, which records customer information and a transaction content thereon, which stores a string of journals therein, and provides a single receipt to a customer, comprising:

a housing having, a receipt dispensing port through which the receipt is dispensed;

storing means disposed in said housing, for storing the string of slips which can be taken out;

guiding means engageable with the string of slips taken out from said storing means, for allowing the string of slips to travel along a conveying direction on a first conveying passage;

first separating means disposed adjacent to said guiding means along the conveying direction, for temporarily separating the string of slips into the string of receipts and the string of journals;

printing means disposed adjacent to said first separating means along the conveying direction, for allowing the strings of receipts and journals which are separated by said first separating means to come together and for printing predetermined transaction content thereon;

cutting means disposed between said printing means and said first separating means, for cutting the single receipt for one transaction from the string of receipts separated from the string of journals; and

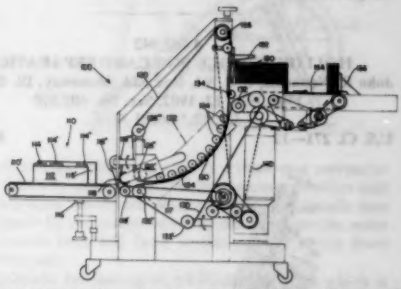
second separating means disposed adjacent to said printing means along the conveying direction, for separating the string of slips into the string of receipts to be conveyed in a second conveying passage and the string of journals in a third conveying passage when issuing the single receipt and for allowing the strings of receipts and journals to come together and travel on said third conveying passage when setting the string of slips.

4,463,940

APPARATUS AND METHOD FOR CONTINUOUS STACKING OF SIGNATURES USING OPPOSED FLOATING CONVEYORS

Russell V. Mock, 124 Columbia Heights, Brooklyn, N.Y. 11201

Filed Oct. 18, 1982, Ser. No. 435,090
Int. Cl.³ B65H *39/02*
U.S. Cl. 270—54 **10 Claims**



1. A signature stacker adapted to the production of stacks of one or more incoming streams of lapped signatures comprising:

A. a stacker frame having input and output ends;

B. a signature crusher station which is mounted adjacent the input end;

C. a compression conveyor station which is mounted on stream with the crusher station, said compression conveyor station including opposed floating conveyors, at least one conveyor being compressed in contiguous opposition to the other; said conveyors defining by means of plural rollers a support path for one conveyor to effect an arcuate upward transition from the signature crusher station;

D. a signature receiver station, located on stream of the compression conveyor at the output end of the stacker, said receiver guiding successive signatures into stacking registry with one another;

E. means activating the crusher and conveyor stations.

4,463,941

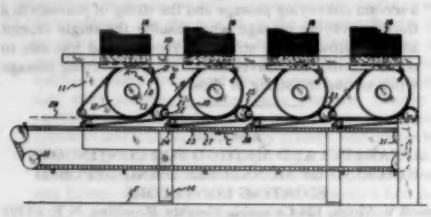
METHOD AND APPARATUS FOR OPENING FOLDED SHEETS

James R. Schlough, Easton, Pa., assignor to Stobb, Inc., Clinton, N.J.

Division of Ser. No. 328,236, Dec. 7, 1981, abandoned. This application Jun. 22, 1983, Ser. No. 506,853
Int. Cl.³ B65H *39/02*
U.S. Cl. 270—54 **19 Claims**

1. A method for opening folded sheets to be gathered together on a gathering conveyor moving along a pair of movement, each sheet being folded to define two flaps connected along a fold line and folded so as to have the one edge opposite the fold line and of one flap extend beyond the other edge opposite the fold line and of the other flap to form a lap margin, moving the folded sheet toward the gathering conveyor and in

a substantially horizontal orientation with said one edge positioned below said other edge, engaging said one edge of the moving folded sheet on a guide curved surface and sliding said one edge under said curved surface while guiding said one edge away from said other edge to thereby unfold said sheet,



guiding said one edge of said sheet to one side of the path of movement of the gathering conveyor and positioning said other edge of said sheet to the other side of the path of movement so as to deposit each said sheet with said flaps straddling the gathering conveyor.

4,463,942

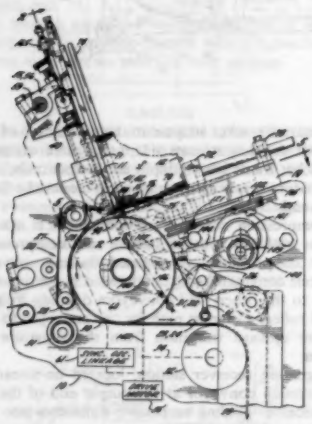
HOLLOW NEEDLE FOR CARD SEPARATION

John R. Newsome, R.R. #1, Box 58A, Shumway, Ill. 62461

Filed Aug. 12, 1982, Ser. No. 407,510

Int. Cl.³ B65H *3/14*

U.S. Cl. 271—12 **8 Claims**



1. A machine for feeding cards from a vertical stack having a leading edge portion and a trailing edge portion, the cards in the stack having their leading edges in alignment with one another to form a lower corner on the stack comprising, in combination, a frame, a platform on the frame positioned to support the trailing edge portion of the stack and in contact with the bottom card in the stack, a vertical guide at right angles to the platform for engaging the aligned leading edges of the cards in the stack, the edge of the platform being horizontally spaced from the vertical guide to define a downwardly facing access window under the leading edge portion of the stack, a stripper type support for the leading edge corner portion of the stack in the form of a needle having a downwardly angled tip portion extending inwardly and downwardly with respect to the window by a shallow amount under the corner of the stack so that the leading edge of the bottom card rests against the tip portion of the needle, a suction cup facing upwardly into the window, a source of suction connected to the suction cup, means mounting the suction cup for vertical movement between an upper position in which the sucker cup is in engagement with the bottom card of the stack and a downwardly retracted position which is below the tip portion of the needle so that the leading edge of the bottom card flicks past the tip of the needle as the card is drawn downwardly, drive means for cycling the suction cup between its upper position and its downwardly retracted position, the source of suction having control means synchronized with the drive means so that the suction is effective in the upper position of the cup and during the course of downward movement, the needle being of hollow construction and having a source of pressurized air, the tip portion of the needle having a longitudinally extending discharge orifice which faces upwardly and which extends both above and below the corner of the stack dividing the orifice into an upper portion and a lower portion, the source of air being at a sufficiently high pressure so that air from the upper portion of the orifice is forced between the lowermost cards in the region above the suction cup thereby breaking any suction which may exist between the cards and serving as a lubricant for the bottom card facilitating its prompt release from the stack upon downward movement of the suction cup, and means for subsequently gripping the bottom card for drawing the card clear of the platform and for transporting the card from its downwardly retracted position.

4,463,943

DISPENSER FOR DISPENSING PHOTOGRAPHIC SHEETS FROM A STACK

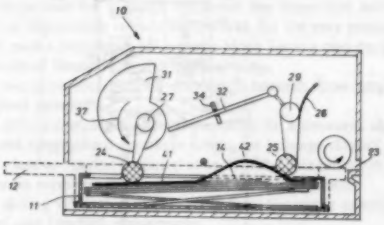
Hugo F. Deconinck, Deurne-Zuid, Belgium, assignor to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Sep. 3, 1981, Ser. No. 299,011

Claims priority, application United Kingdom, Sep. 8, 1980, 8028897

Int. Cl.³ B65H *3/06*

U.S. Cl. 271—21 **8 Claims**



1. A dispenser for dispensing photographic sheets one-by-one from a stack, said dispenser having a stack-receiving and locating means, a dispensing mechanism for frictionally engaging the next sheet to be dispensed from the top of the stack and applying to such sheet forces causing buckling of a portion thereof leading to eventual separation of an end of the sheet from the stack, and sheet transport means for engaging the thus-released end of the sheet and withdrawing it from the stack, said dispensing mechanism comprises a first sheet buckling means operative to frictionally engage one end portion of the sheet to be dispensed and advance the same toward the opposite sheet end portion to create a generally transversely-directed buckle in said sheet between its end portions, a second sheet buckling means movable between an inoperative out-of-the-way position and an operative position adapted to frictionally engage the opposite end portion of the buckled sheet, and means for moving said second buckling means along a path leading to said inoperative position that is generally inclined inwardly toward said first sheet end portion and upwardly away from the stack top to displace the opposite sheet end portion engaged by said second buckling means generally along said path to increase the extent and acuteness of the buckle curvature, said second buckling means including a sheet releasing surface on its side facing generally away from said

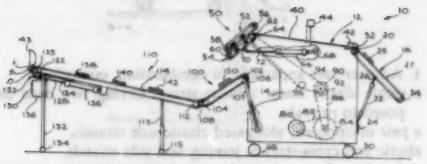
first buckling means when in said operative position, said releasing surface having a coefficient of friction substantially smaller than the coefficient of friction of said buckling means and taking over contact with said opposite end portion generally when said second buckling means reaches the inner end of its inclined path, whereby the upwardly and inwardly displaced end portion springs forwardly under the elastic recovery forces in said sheets to project the opposite sheet end portion forwardly of the corresponding end of the stack, and said transport means is located to receive the thus projected opposite end portion.

4,463,944

LAUNDRY STACKING APPARATUS

Frederick W. Grantham, 12055 Goshen Ave., Los Angeles, Calif. 90049

Filed Sep. 27, 1982, Ser. No. 423,672
Int. Cl.³ B65H *29/50*
U.S. Cl. 271—200 **12 Claims**



1. Stacking apparatus for workpieces comprising:
a main frame;
a delivery arm pivotably connected thereto;
a piece conveyor system adapted to convey said pieces along said frame to said delivery arm, said delivery arm comprising a double conveyor for transporting and discharging said pieces to form a stack;
actuating means for oscillating said arm first in one direction and then in the other through a predetermined angle of oscillation;
detector means in said conveyor system responsive to the passage of a workpiece;
control means operative in response to said detector means for controlling said actuating means;
means for forming a stack of a predetermined number of said workpieces in a work deposit zone;
counter means for providing an indication of the number of workpieces in said stack; and
a stack conveyor system comprising:
a first conveyor, having an upper surface portion, mounted at a selected orientation to develop a rounded surface for the deposit of the pieces thereon in a generally centered alignment with the upper portion of said surface;
a second conveyor coupled to said first conveyor in common driving relationship; and
means for intermittently advancing both of said first and second conveyors when the stack of deposited pieces reaches a predetermined count to remove the stack from the work deposit zone, the intermittently advancing means comprising a one-way clutch coupled to a drive roller of one of the first and second conveyors and a reciprocating actuator coupled to the one-way clutch by a drive chain.

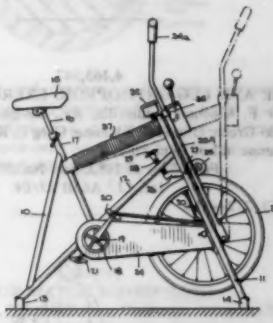
4,463,945

EXERCISE MACHINE

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Nov. 10, 1982, Ser. No. 440,609
Int. Cl.³ A63B *69/16, 69/06*
U.S. Cl. 272—73 **7 Claims**

1. An exercise machine which entails simultaneous peddling and rowing actions to afford a total body workout, the machine comprising:
A a stationary bicycle frame having front and rear sections and a beam bridging these sections;
B an upright post anchored at an intermediate position of the beam to support a saddle;
C a sprocket wheel mounted for rotation on said beam and provided with foot pedals;
D a front wheel support at a raised position for rotation on said front section, said wheel being linked by an endless chain to said sprocket wheel whereby a user seated in the saddle with his feet on the pedals, is able to turn the front wheel;



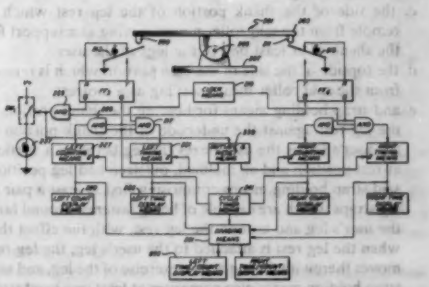
E a pair of poles joined together by a transverse connector and pivotally mounted on said front section on either side of said front wheel, said poles terminating in handle bars graspable by the seated user who can then row the poles to execute back and forth strokes relative to the front section; and
F a hydraulic bar having an oil-filled inner tube which is telescopically received in an outer tube, the axial movement in either direction being damped by the flow of oil to offer resistance to said movement, said bar being extended between the connector and the post to uniformly resist movement of the poles in back and forth strokes.

4,463,946

FITNESS EVALUATION APPARATUS

Lynn A. Wallace, P.O. Box 255, Shaker Heights, and Max E. Sallach, P.O. Box 313, Chesterland, both of Ohio 44026

Filed Dec. 28, 1981, Ser. No. 334,971
Int. Cl.³ A63B *71/06*
U.S. Cl. 272—111 **15 Claims**



1. Apparatus for measuring a person's balance, said apparatus comprising:
balance beam means for moving between positions of balance wherein the person maintains his balance, and imbalance wherein the person loses his balance;

counting means for counting the number of times said balance beam means moves from the balance position to an imbalance position;

first switching means for actuating said counting means in response to movement of said balance beam means from the balance position to an imbalance position including a first switch actuated by said balance beam means;

count display means for visually displaying the counted number of times said balance beam means moves from the balance position to an imbalance position; and

timing means for measuring the time said balance beam means remain in an imbalance position.

4,463,947

KNEE AND LEG ORTHOPEDIC EXERCISING DEVICE

Arthur F. Kloenne, Louisville, Ky., assignor to Steve Green; Vicki Green; Daniel A. Kloenne; Greg E. Kloenne and Amy E. Kloenne, all of Louisville, Ky.

Filed May 6, 1982, Ser. No. 375,502
Int. Cl.³ A63B *23/04*
U.S. Cl. 272—116 3 Claims

1. A knee and leg orthopedic exercising device for use by a person in a seated position in a chair comprising:

a. a wide leg rest of integral construction having a side upright profile of an inverted capital T with a vertical shank portion that has a free distal end and is supported from a base portion generally perpendicular thereto at the other end of the vertical shank;

b. the base portion including one free edge which is remote from the shank portion having an enlarged roller means which is adapted to be able to contact a floor surface when the base portion is at rest on the floor surface for ease in moving the leg;

c. the side of the shank portion of the leg rest which is remote from the said roller means serving as a support for the shank of at least one of the legs of the user;

d. the topside of the side of the base portion which is remote from the said roller means serving as a footrest;

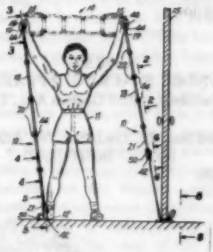
e. and strap holding means for holding the shank portion of the leg rest against the underside of the shank portion of the user's leg as the user flexes the leg between a vertical at-rest position and an inclined, outstretched leg position, said strap holding means comprising first at least a pair of leg straps which are capable of being fastened around both the user's leg and around the leg rest, with the effect that when the leg rest is attached to the user's leg, the leg rest moves therewith during active exercise of the leg, and said strap holding means also comprises at least one hand strap that is attached to the shank portion of the leg rest adjacent the distal end thereof so that the user may use his hand and arm to pull back on the hand strap so as to hold the leg rest tight against the user's foot as well as in contact with the shank portion of the user's leg.

4,463,948

EXERCISER WITH CROSS-STRAND MEANS JOINED BY CROSS-KNOTS

Robert B. Mohr, Southgate Tower #12B, 371 Seventh Ave., New York, N.Y. 10001

Filed Jun. 30, 1982, Ser. No. 394,020
Int. Cl.³ A63B *21/04*
U.S. Cl. 272—136 6 Claims



1. An exerciser apparatus, in combination, comprising:

a single elastic linear tubular strand having two ends disposed to provide,

a pair of opposed, elongated elastic side strands,

elastic end cross-strands joining said side strands,

a plurality of ecross-strand means joining said side strands at intervals between said end cross-strands, each of said inner cross-strand means including two adjoining portions of said single elastic linear strand,

a plurality of gripping means enclosing said end cross-strands and said inner cross-strand means for providing grips for a user,

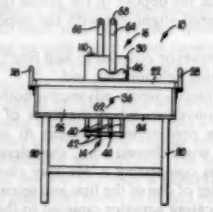
portions of said single linear strand being joined at a cross-knot at said inner cross-strand means, and said two ends of said single linear strand being joined at a final knot at one of said end cross-strands.

4,463,949

MACHINE FOR ARM WRESTLING

George W. McCoy, Sr., and George W. McCoy, Jr., both of Olathe, Kans., assignors to McCoy Manufacturing Company, Olathe, Kans.

Filed Nov. 21, 1983, Ser. No. 553,767
Int. Cl.³ A63B *21/28*
U.S. Cl. 273—1 GI 13 Claims



1. An arm wrestling device comprising:

a generally flat support surface;

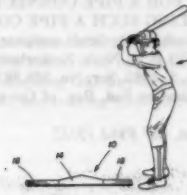
a pair of elongated, spaced-apart levers;

means mounting each lever for pivoting about a point adjacent said support surface whereby each lever is pivotal in a plane generally transversely-oriented to said support surface; and

means operably coupling said levers for allowing two contestants to arm wrestle by applying force to the respective

levers, said coupling means including structure permitting selective operation between first and second operating modes, whereby in said first mode said levers are operably interconnected to pivot in the same direction allowing contestants to arm wrestle with each contestant using the same arm to grasp said lever, and in said second mode said levers are operably interconnected to pivot in opposite directions allowing contestants to arm wrestle with one contestant using the right arm and the other contestant using the left arm.

4,463,950
BATTING PRACTICE TRAINER
Orville E. Elkin, P.O. Box 348, Winnsboro, La. 71295
Filed Oct. 10, 1980, Ser. No. 196,128
Int. Cl.³ A63B *71/00*
U.S. Cl. 273—26 R **4 Claims**



1. A batting practice training, safety and educational apparatus comprising:

a baseball home plate constructed of a flat material for use during batting practice and educational training sessions and having a color indicia throughout for serving to assist the batter relative to the location of the batter's box and home plate and the lateral strike zone area thereof; and

batter positioning means for said flat material extending contiguously on each side of the baseball home plate so constructed and arranged integrally therewith for defining limits of a strike zone portion and a batter positioning portion, the batter positioning means including contrasting color indicia throughout relative to the color indicia of the baseball home plate and having an upper roughened, faceted surface so as to enhance light reflection, the visibility together with the educational and training capability thereof.

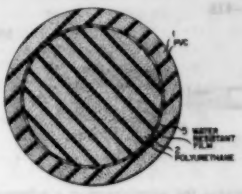
4,463,951
BALL
Sadao Kumasaka, and Satomi Tada, both of Tokyo, Japan, assignors to Oyo Rubber Chemical Industry Co., Ltd., Tokyo, Japan
Filed Mar. 9, 1982, Ser. No. 356,524
Claims priority, application Japan, Mar. 17, 1981, 56-37322[U]; Apr. 22, 1981, 56-58170[U]; May 27, 1981, 56-77073[U]; May 30, 1981, 56-79847[U]; May 30, 1981, 56-78848[U]; Feb. 2, 1982, 57-15386; Feb. 2, 1982, 57-15387
Int. Cl.³ A63B *37/02, 39/00*
U.S. Cl. 273—58 A **5 Claims**

1. A ball comprising:

a spherical body of polyurethane foam having open cells, and

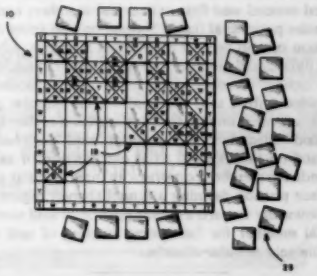
a surface layer of foamed polyvinyl chloride having closed cells integrally formed on the surface of said spherical body of polyurethane foam;

said ball having been produced by forming said surface layer by rotational casting in a mold to form a hollow foamed polyvinyl chloride body having closed cells and a central



cavity therein and charging a foamable polyurethane composition into said cavity and foaming said composition to integrally form a spherical body of polyurethane foam having open cells integral with said surface layer of foamed polyvinyl chloride having closed cells.

4,463,952
COLOR MATCH BOARD GAME
Robert M. Rowbal, 731 Bluff Ave., Shakopee, Minn. 55379
Filed Aug. 2, 1982, Ser. No. 404,530
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—236 **9 Claims**



1. A board game comprising:

(a) a square playing board having playing squares, a first playing square which abutts a first perimeter edge of the playing board having that portion of the perimeter edge which abuts the first playing square marked with a color from a group of three colors, a second playing square which abuts the first playing square and the first perimeter edge having that portion of the perimeter edge which abuts the second playing square marked with one of the two remaining colors, a third playing square which abuts the second playing square and the first perimeter edge having that portion of the perimeter edge which abuts the third playing square marked with the remaining of the three colors, the group of three colors repeating around the remaining three perimeter edges of the playing board; and

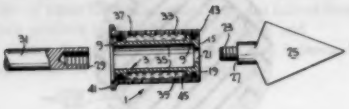
(b) color chips, each the same size as the playing squares, each color chip divided into triangularly colored areas wherein each side of a color chip is a side of a triangular colored area, the triangularly colored areas being colored with a color from a group consisting of six colors, three of which are the same colors as contained in the group set forth in subpart (a) of this claim 1.

4,463,953

ARCHERY POD

William R. Jordan, c/o Leon Jordan Marine, 3902 Columbus-Manchester Expressway, Columbus, Ga. 31904

Filed May 20, 1983, Ser. No. 496,657
Int. Cl.³ F41B 5/02
U.S. Cl. 273—418 **6 Claims**



1. An apparatus for administering a substance beneath the surface of a target and adapted for use with an aerial projectile having a shaft, said apparatus comprising:

a first cylindrical member having a first axial end portion and a second axial end portion;

a first annular peripheral flange formed on said first axial end portion of said first cylindrical member and projecting radially outwardly therefrom;

a second annular peripheral flange formed on said second axial end portion of said first cylindrical member and projecting radially outwardly therefrom;

a third annular flange formed on said first axial end portion of said first cylindrical member and projecting radially inwardly therefrom to form a pocket within said first cylindrical member for receiving said shaft;

sealing means provided around an outer circumferential edge portion of each of said first and said second annular peripheral flanges;

a second cylindrical member having a first axial end portion and a second axial end portion and concentrically disposed around said first cylindrical member; and

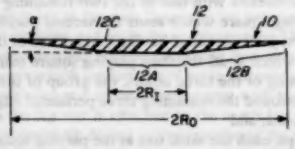
an annular peripheral flange formed on said second axial end portion of said second cylindrical member, wherein said first cylindrical member and said second cylindrical member define therebetween an annular chamber axially bounded within said first and second annular peripheral flanges formed on said first cylindrical member for storage of said substance, and wherein said peripheral flange formed on said second axial end portion of said second cylindrical member comprises an inner annular chamfered surface portion defining a funnel shaped region converging inwardly toward a center portion of said second cylindrical member for facilitating loading of said substance within said annular chamber.

4,463,954

AQUATIC DEVICE

Richard G. Panse, and Jane E. Panse, both of 903 Lake Shore Dr., Apt. 107, Lake Park, Fla. 33403

Filed Dec. 10, 1982, Ser. No. 448,784
Int. Cl.³ A63B 65/10, 67/06
U.S. Cl. 273—424 **9 Claims**



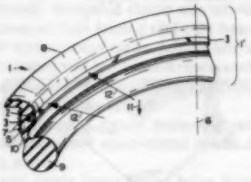
1. An aquatic device that is to be manually thrown or otherwise projected for skimming upon and across the surface of a body of water essentially at the air-water interface, said aquatic device comprising; a buoyant body having an upper portion and a lower portion together defining said buoyant body having a peripheral locus on a predetermined radius, R_O, said lower portion including a central bottom area of a predetermined radius, R_I, said body including a tapered wall surface extending peripherally and outwardly from the perimeter of said central bottom area and tapered upwardly from said central bottom area by a predetermined small angle "alpha" to the peripheral locus of said body, said angle "alpha" being less than about 8.5° measured from said central bottom area, and having a value predetermined with relation to the ratio R_I/R_O and the weight per plan-area-ratio of the device, where said radius ratio does not exceed 0.8 and said weight per plan-area ratio does not exceed 0.35 oz/in^2, so as to provide hydrodynamic forces for skimming when said body is projected across said water-body surface.

4,463,955

SEALING DEVICE FOR A PIPE CONNECTION AND METHOD FOR SEALING SUCH A PIPE CONNECTION

Johannes C. Delhaes, Nuth, Netherlands, assignor to Rubber- en Kunststoffabriek ENBI B.V., Nuth, Netherlands

Filed Dec. 5, 1983, Ser. No. 558,387
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247452
Int. Cl.³ F16J 15/12
U.S. Cl. 277—1 **7 Claims**



1. A sealing device for a pipe connection in which a uniform diameter pipe end of one pipe section is plugged into a socket at an end of an adjacent pipe section, comprising a profiled sealing ring of an elastomeric material having an outer diameter fitting into said socket and a radially inwardly facing surface with a groove in said inwardly facing surface, said groove having a groove bottom, and an endless steel expansion ring in said groove, said endless steel expansion ring having a radially outer surface abutting in a gapless manner against said groove bottom, said endless steel expansion ring having an outer diameter which, in the sealing position of the sealing ring and thus in the expanded position of the endless steel expansion ring, is enlarged beyond the elastic limit of the steel of which the endless steel expansion ring is made.

4,463,956

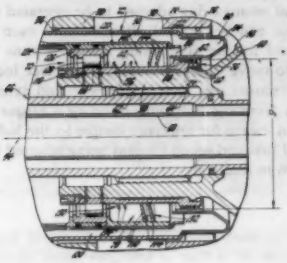
SHIELD FOR LABYRINTH SEAL

Richard C. Malott, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 21, 1983, Ser. No. 515,693
Int. Cl.³ F16J 15/44; F01D 25/18
U.S. Cl. 277—12 **3 Claims**

1. In a gas turbine engine having a rotating member rotatable about a vertical axis, a support, a lubricated bearing between said rotating member and said support, and a labyrinth seal axially outboard of said bearing between said support and said rotating member including an element defining a minimum diameter for passage of said rotating member, a shield comprising, an inner helical baffle on said rotating member disposed between said bearing and said labyrinth seal in an assembled position of said rotating member, said inner baffle having a preselected lead and an outside diameter less than said minimum diameter and a length sufficient to define at least one full pitch, and an outer helical baffle on said support disposed between said inner baffle and said labyrinth seal in said assem-

bled position of said rotating member, said outer baffle having said preselected lead so that said inner baffle can be threaded therethrough and an inside diameter less than said outside



diameter of said inner baffle and a length sufficient to define at least one full pitch so that said inner and said outer baffles cooperate in shielding said labyrinth seal against vertical lubricant drip from said bearing through 360°

4,463,957

SEALING DEVICE FOR ROTARY SHAFT AND STRING-LIKE MEMBER FOR DEFINING SPIRAL THEREFOR

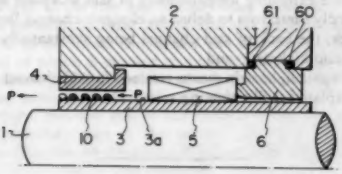
Yataro Nagai, and Yoshiro Imai, both of Tokyo, Japan, assignors to Tanken Seiko Corp., Tokyo, Japan

Filed Jul. 1, 1981, Ser. No. 279,252

Claims priority, application Japan, Jul. 4, 1980, 55-94346[U]; Jul. 4, 1980, 55-94347[U]; Jul. 4, 1980, 55-94348[U]; Jul. 4, 1980, 55-94349[U]

Int. Cl.³ F16J *15/40*

U.S. Cl. 277—34 **26 Claims**



1. A sealing device for a rotary shaft means which rotates relative to a stationary member, comprising:

a spiral-shaped sealing member separate from said rotary shaft means and said stationary member, said spiral-shaped sealing member having a predetermined pitch, a predetermined thickness and a predetermined height in the radial direction thereof; and

means for fixedly mounting said separate spiral-shaped sealing member on a surface portion of a least one of a rotating portion of said rotary shaft means and a stationary portion of said stationary member which is adjacent to said rotating portion.

4,463,958

MECHANICAL FACE SEALS

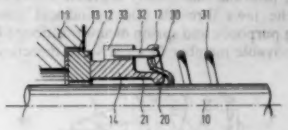
Stanley A. Butler, Burnham, England, assignor to Crane Packing Limited, Slough, England

Filed Jan. 25, 1983, Ser. No. 460,888

Claims priority, application United Kingdom, Jan. 28, 1982, 8202404

Int. Cl.³ F16J *15/34*

U.S. Cl. 277—84 **13 Claims**



1. A mechanical face seal comprising:

a seat member associated with one of a pair of relatively rotatable components;

a seal face member associated with the other component, said seal face member having a secondary sealing means formed integrally therewith, the secondary sealing means comprising a sealing formation which is connected to the seal face member by a relatively flexible web portion;

means which acts against the sealing formation of the secondary sealing means to apply;

an axially compressive load to the web portion and thereby urge the seal face member into sealing engagement with the seat; and

a radial load to urge the sealing formation into sealing engagement with the seal face member and thereby provide a fluid tight seal between the seal face member and its associated component.

4,463,959

COMPOSITE GASKET INCLUDING RINGS OF REFRACTORY SHEET MATERIAL AND KNITTED WIRE MESH

Peter P. Usher, Union, and Eugene J. Gavaletz, Toms River, both of N.J., assignors to Metex Corporation, Edison, N.J.

Filed Mar. 21, 1983, Ser. No. 477,173

Int. Cl.³ F16J *15/12*; B32B *31/06*

U.S. Cl. 277—230 **7 Claims**

1. A composite gasket of predetermined thickness having an upper and lower surface, said composite gasket having a relatively dense portion including a relatively thin sheet of refractory material proximate the upper and lower surfaces separated by a layer of knitted wire mesh, a relatively less dense portion including only knitted wire mesh.

4,463,960

SELF-ADJUSTING CHUCKS

Jean Walton, 69 S. Hill Park, London, NW3, England

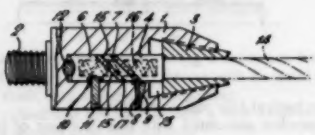
Filed May 11, 1981, Ser. No. 262,678

Int. Cl.³ B23B *31/12*

U.S. Cl. 279—60 **6 Claims**

1. A chuck comprising a body, an aperture formed in a front portion of the body, jaws which are housed in the aperture and which are retractable to enable insertion of a bit, jaw clamping means for applying pressure on the jaws such that in use they clamp against a bit and retain the bit in the chuck, a cylindrical member, track means positioned in the body, said track means

being a helical groove which is formed in the cylindrical member, a first member located in the body of the chuck and engaging the cylindrical groove, and a drive fitting which is located at a rear portion of the body and which is for enabling the chuck to be connected to and rotatably driven by a drive tool, the jaw clamping means comprising an axially movable member, a clamping device for moving the axially movable member in a forward direction towards the jaws and for causing a pressure to be applied to the jaws when the jaws are in their bit clamping position, said axially movable member being operable on the jaws through said cylindrical member for jaw clamping purposes, and spring means positioned for biasing the axially movable member in a rearward direction towards the



drive fitting, and the track means extending in a longitudinal direction but also being inclined to the longitudinal axis of the chuck whereby the track means causes a constant dimension to be maintained between a surface in the chuck and the axially movable member whereby the jaws are movable with respect to the axially movable member and the clamping device without changing the said constant dimension so that movement of the clamping device for clamping the jaws on an inserted bit is independent of movement of the jaws to accept bits of different sizes so that substantially the same degree of clamping movement is required of the clamping device to clamp the jaws on all inserted bits irrespective of the size of the bits and whereby substantially different degrees of clamping movement for different sizes of bits are obviated.

4,463,961

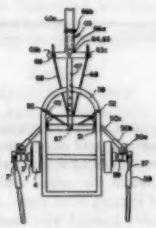
MANUALLY MOVING A TRAILER

Alexander T. Fernandez, 4074 Gratiot Ave., Port Huron, Mich. 48060

Continuation of Ser. No. 93,509, Nov. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 895,443, Apr. 11, 1978, abandoned. This application Sep. 30, 1981, Ser. No. 307,222

Int. Cl.³ B60K *9/00*

U.S. Cl. 280—3 **15 Claims**



1. Apparatus for manual movement by one person of a two-wheeled trailer for boats or the like that includes a frame, a pair only of laterally spaced wheels supporting said frame at the rearward end thereof, and an elongated longitudinally extending towing tongue at the forward end of said frame, said apparatus being adapted to be attached to said trailer and comprising a wheel piece for removable but rigid mounting on the outside of each of said two wheels to rotate therewith, each wheel piece having a laterally outwardly extending central hub coaxial with the axis of said wheels when the piece is mounted on its respective wheel, said hub being adapted to receive manually applied torque for transmittal by said wheel pieces into said wheels, first means for operative connection to one of said hubs to manually apply torque and thus to a wheel, second means for operative connection to the other of said hubs to manually apply torque thereto and thus to a wheel, said first and second means being adapted to be operated separately so that torque can be applied alternately to each of said two wheels, said tongue comprising a lever means for applying leverage to move the frame, each wheelpiece including a rod in torque transmitting relationship with and extending axially outwardly from the hub and providing a torque transmitting connection means for applying torque to the hub and wheelpiece, said first and second means being adapted for operative connection to said rods.

4,463,962

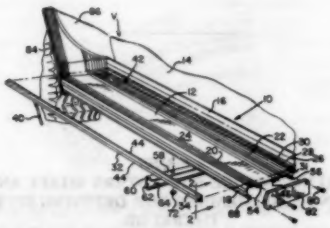
RUNNING BOARD AND LIGHTING ASSEMBLY

Steven A. Snyder, Constantine, Mich., assignor to Coachmen Industries, Inc., Elkhart, Ind.

Filed Feb. 12, 1982, Ser. No. 348,508

Int. Cl.³ B60Q *1/32*

U.S. Cl. 280—164 R **9 Claims**



1. A running board for mounting on a vehicle having an elongate horizontally extending deck and an elongate kickplate extending angularly upwardly from an edge of the deck, wherein the improvement comprises:

flange means formed integrally in one piece relationship with said kickplate on an exterior face thereof, said flange means extending longitudinally of said kickplate and outwardly therefrom to define an elongate channel facing the deck, the back of said channel being substantially closed by said kickplate; and

an elongate light strip means retained in said channel on said kickplate for illuminating said deck.

4,463,963

DRIVING MECHANISM FOR BICYCLE AND THE LIKE DEVICES

Savy Martin, 43B Gitanjali, Behind Strand Cinema, Colaba, Bombay, State of Maharashtra, India 400 005

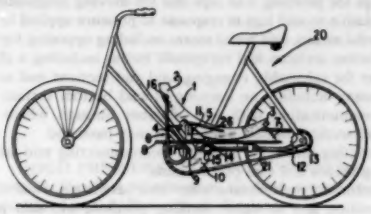
Filed Sep. 28, 1981, Ser. No. 305,923

Int. Cl.³ B62M *1/04*

U.S. Cl. 280—253 **4 Claims**

1. A driving mechanism for a bicycle and the like devices having a conventional frame, seat and chain and axle drive, comprising an oscillating arcuate body oscillatingly mounted on a base secured to the frame; said arcuate body having a foot rest connected to a bracket attached to said base, a connecting

rod connecting the front tip of said arcuate body to an eccentrically mounted crank shaft, and a sprocket wheel mounted on



said crank shaft driving the chain and axle drive of the cycle, said arcuate body being weighted at each of its two ends.

4,463,964

REAR SUSPENSION SYSTEM FOR MOTOR VEHICLES

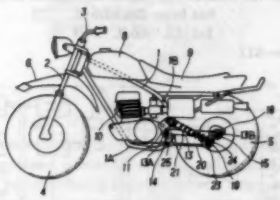
Shinji Takayanagi; Yoshitaka Kato; Kunio Nanno; Osamu Yasunaga; Osamu Takeuchi; Ryozo Yamamoto; Kazuhiro Iwai, and Hiroshi Kasai, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 428,801

Claims priority, application Japan, Mar. 26, 1982, 57-49860; May 21, 1982, 57-86123

Int. Cl.³ B62K *25/02*

U.S. Cl. 280—284 **6 Claims**



1. In a motor vehicle having at least one rear wheel, a swing member which at the rear end thereof supports said rear wheel, and a vehicle body frame to which is pivoted through a mounting member the front end of said swing member, a rear suspension system comprising:

a link member, the upper end of said link member being pivoted to the rear end of said swing member;

a rod member, the rear end of said rod member being pivoted to the lower end of said link member and the front end of which is pivoted to a lower end of said mounting member positioned near and substantially under the pivoted portion of said vehicle body frame; and

a damper, the rear end of said damper being pivoted in an intermediate part in the vertical direction of said link member and the front end of said damper being pivoted to an upper end of said mounting member positioned near and substantially above said pivoted portion of said vehicle body frame.

4,463,965

TRAILER MOUNTED BOAT RETAINER DEVICE

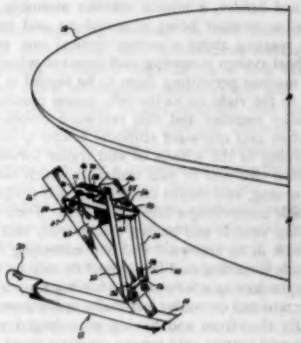
Floyd A. Lawson, 707 Mill St., Northport, Mich. 49670

Filed Sep. 29, 1982, Ser. No. 426,853

Int. Cl.³ B62D *3/10*

U.S. Cl. 280—414.1 **5 Claims**

1. A retainer device for use in combination with a boat trailer, said retainer device adapted to engage the bow eyelet of a boat when resting upon said trailer, said trailer including a generally horizontal frame part, a generally upright front post member attached to said frame part, said retainer device comprising a frame adapted for attachment to said trailer post member, a platform member carried by said device frame, said platform member including a guide slot means opening at one edge of the platform member for receiving said boat bow eyelet, the other end of said platform member including means for connecting said attachment device to said trailer front post member, a securement means pivotally attached to said platform member for engaging and securing said bow eyelet within said slot means and being shiftable between a first position whereby said slot means is open to receive said boat bow eyelet and a second position whereby said securement means extends into said slot means to engage and secure the boat bow eyelet within the slot means, actuating means located in mechanical communication with said securement means for manually



shifting the securement means about a pivot axis between its said first and second positions, said actuating means including a rod pivotally mounted on said platform member adjacent a side edge of said securement means, said rod pivotable about a pivot axis spacedly located from said securement means pivot axis and including spaced projections on opposite sides of said rod pivot axis whereby pivoting movement of said rod in one direction causes one of said rod projections to contact said securement means side edge to urge said securement means into its said first position and pivoting movement of said rod in the opposite direction causes the other of said rod projection to contact said securement means side edge to urge the securement means into its said first position.

4,463,966

TRAILER TOWING AND STEERING SYSTEM

Ronald L. Stoddard, Rte. 1, Box 80, Hershey, Nebr. 69143

Filed Feb. 11, 1982, Ser. No. 347,876

Int. Cl.³ B62D *13/02;* **D62D** *13/04*

U.S. Cl. 280—442 **4 Claims**

1. A trailer towing and steering system comprising: a towing vehicle having right and left rearmost wheels, a trailer spaced behind said towing vehicle, a tongue extending between said vehicles, hitch means connecting said tongue to said towing vehicle in a manner for the pivoting of said tongue about a vertical towing axis at a rearward portion of said towing vehicle and also in a manner for the pivoting of said tongue upwardly and downwardly at its forward end about a horizontal tongue-axis at its rearward end, a stationary forward elliptical holder disposed beneath said towing vehicle, means maintaining said forward elliptical holder in a stationary position with

respect to said towing vehicle, a rotating rearward elliptical holder beneath said trailer, means rotatably mounting said rearward holder on said trailer for rotation about a vertical axis, said trailer having a forward wheel system and a rearward wheel system, said trailer having the wheels of its forward wheel system mounted in a manner for turning said trailer during forward or rearward movement of said trailer, said tongue being attached to said trailer in a manner for extending straight forwardly therefrom at all times, a flexible connector system extending along said tongue and interconnecting said elliptical holders whereby a turning inclination of said truck with respect to said tongue as said towing vehicle and forward elliptical holder turn causes a movement of said flexible connector system bringing corresponding rotation of said rearward elliptical holder, a motion transfer assembly having a rotating trailer member being mounted on said trailer in a manner for rotating about a certain vertical axis, said trailer forward wheel system mounting said forward wheels on said trailer in a manner permitting them to be turned at their forward sides to the right or to the left, means connecting said rotating trailer member and said rearward elliptical holder whereby when said rearward elliptical holder is rotated this causes a turning of the wheels of said trailer forward wheel system toward that side of said trailer to which said towing vehicle is turning, said means connecting said tongue to said towing vehicle comprising a fifth wheel under a rearward part of said towing vehicle and having a forwardly and inwardly tapering notch in its rearward end and extending forwardly therein, means mounting said fifth wheel on said towing vehicle, said tongue having a forward end having a hitch pivot pin attached thereto and extending vertically upward and projecting upwardly therefrom and having an enlarged upper end spaced from said tongue, said tongue pivoting about a vertical axis extending through said hitch pin, a forward elliptical holder fixing pin connected to said forward elliptical holder and projecting above said tongue and having an enlarged upper end spaced from said tongue, said fifth wheel receiving said hitch and fixing pins in said notch with the enlarged upper ends of said hitch and fixing pins disposed above and lapping said fifth wheel, means releasably locking said hitch and fixing pins into said notch.

4,463,967

SKI BRAKE HAVING DETACHABLE PEDAL

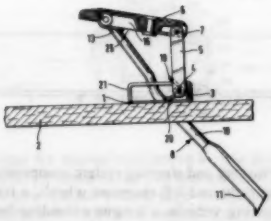
Gerd Klubitschko, Oberau, Fed. Rep. of Germany, assignor to Marker-Patentverwertungsgesellschaft mbH, Baar, Switzerland

Filed Nov. 15, 1982, Ser. No. 441,667

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1981, 3145646

Int. Cl.³ A63C 7/10

U.S. Cl. 280—605 **10 Claims**



1. A brake for a ski, said brake having longitudinal and transverse directions and comprising:

attaching means for attaching a ski brake to a ski;

a pair of legs, each leg having a lower arm terminating in a free end and an upper arm terminating in an end section, said legs being pivotally connected to said attaching means and said end sections being transversely opposite each other;

pedal means releasably engaging said ends sections of said legs for pivoting said legs and for moving longitudinally relative to said legs in response to pressure applied to said pedal means, said pedal means including opposing top and bottom surfaces and receptacle means including a chamber for releasably engaging said end sections and access means including an opening in said bottom surface and communicating with said chamber through which said end sections of said upper arms may pass; and

connecting means for movably interconnecting said attaching means and said pedal means;

wherein said pedal means is movable between a lower skiing position and an upper braking position, and said pedal means having opposing fore and aft ends, the fore end of said pedal means being manually movable to a raised position when said pedal means is in the braking position to enable manual movement of said end sections of said upper arms in the longitudinal direction relative to said pedal means for rendering the end sections of said upper arms accessible for disengagement from said pedal means.

4,463,968

METHOD FOR PROGRAMMED RELEASE IN SKI BINDINGS

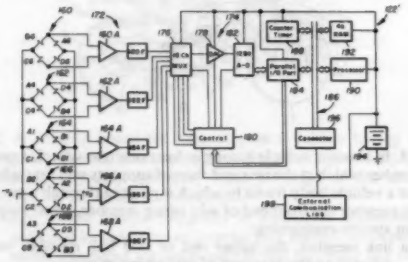
Maury L. Hull, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 162,413, Jun. 24, 1980, Pat. No. 4,371,188. This application Feb. 1, 1983, Ser. No. 463,007

The portion of the term of this patent subsequent to Feb. 1, 2000, has been disclaimed.

Int. Cl.³ A63C 9/08

U.S. Cl. 280—612 **10 Claims**



1. In a ski binding for releasably securing a ski boot to a ski, a method for minimizing injuries in a lower extremity of a skier, said method comprising:

measuring a plurality of mechanical deflections induced in said ski binding from interaction between said skier and said ski;

developing a plurality of first electrical signals, each of said first signals being determined from a different one of said deflections;

developing a plurality of second electrical signals determined from a relationship between said first signals, said second signals defining a measurement of forces along first selected ones of longitudinal, lateral, and vertical axes of said ski and moments about second selected ones of said axes, said mechanical deflections occurring in response to said forces and said moments;

computing from said second signals an actual angle of deflection as a function of a preprogrammed relationship between said second signals, said actual angle of deflection being about a location of said lower extremity of the skier and further resulting from said forces and said moments, said location being selected to prevent injury thereto, said computing step including comparing said actual angle of deflection with a predetermined critical angle of deflec-

tion to initiate a release of said ski binding in the event said actual angle exceeds said critical angle.

4,463,969

HIGH PRESSURE HYDRAULIC SYSTEMS

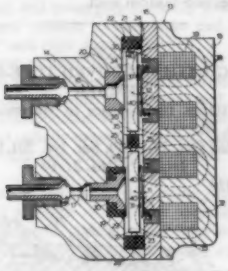
Anthony W. Harrison, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 130,720, Mar. 17, 1980, abandoned. This application Nov. 15, 1982, Ser. No. 441,776

Claims priority, application United Kingdom, Mar. 16, 1979, 7909297

Int. Cl.³ B60G 11/26

U.S. Cl. 280—707 13 Claims



1. A high pressure hydraulic system comprising a source of hydraulic pressure, a control valve assembly and a slave unit, fluid under pressure being supplied to said slave unit from said source through said control valve assembly, said control valve assembly comprising first and second valves, respective first and second solenoids, and means for applying a pressure differential across each said valve said valves being oppositely acting and arranged in series with said first valve located between said source and said second valve, said second valve located between said first valve and said slave unit, each said valve being movable into a closed position in which fluid flow through the said valve in one direction is substantially prevented, such that one said valve prevents flow in a direction from said slave unit to said source, and the other said valve prevents flow in a direction from said source to said slave unit, and each said valve being movable into an open position in which flow in both directions is permitted, movement of each said valve between said open and said closed positions being controlled by forces produced by a first means including said respective solenoid and a second means comprising said pressure differential applying means for the said valve, the forces produced by said first means being of predetermined values that when said solenoids of said first means are energized tending to move said valves from said closed to said open position and said second means produces a force which opposes and exceeds the predetermined value produced by said first means for opening said valves, said first means are unable to move said valves to its open position, each said valve comprising a seating member and a valve member for engagement with said seating member, a seating portion of one of the said members of said valve which in said closed position prevents flow in a direction from said slave unit to said source comprising an element of elastomeric material to provide a substantially leakproof seal when said valve is in said closed position.

4,463,970

SECURITY PAPER HAVING CAMOUFLAGE MATERIALS TO PROTECT ITS AUTHENTICITY FEATURES

Wittich Kaule, Gauting; Gerhard Schwenk, Puchheim, and Gerhard Stenzel, Munich, all of Fed. Rep. of Germany, assignors to GAO Gesellschaft fuer Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Filed Dec. 1, 1981, Ser. No. 326,365

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048734

Int. Cl.³ B42D 15/00

U.S. Cl. 283—72 21 Claims

1. A data carrier comprising:

a substrate;

luminescent marking material on said substrate forming coded information, said luminescent marking material comprising chemical elements in a first configuration having a first luminescent characteristic; and

camouflaging material on said substrate, said camouflaging material comprising said chemical elements, said same chemical elements being in a second configuration having no luminescence or a luminescent characteristic different from said first luminescent characteristic.

11. A method of producing a data carrier comprising applying a first marking material to a substrate, said first marking material containing an activatable component, applying a second marking material chemically indistinguishable from said first marking material to said substrate, subjecting said substrate to means for activating said activatable component in said first marking material.

4,463,971

IDENTIFICATION CARD HAVING AN IC MODULE

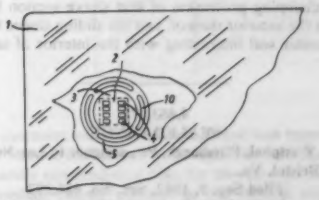
Joachim Hoppe, and Yahya Haghiri-Tehrani, both of Munich, Fed. Rep. of Germany, assignors to Gao Gesellschaft für Automation und Organisation mbH, Munich, Fed. Rep. of Germany

Filed Mar. 25, 1982, Ser. No. 361,660

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1981, 3115045; Aug. 6, 1981, 3131216

Int. Cl.³ G06K 7/08

U.S. Cl. 283—83 16 Claims



1. In an identification card or similar data carrier comprising a card body having an opening therein; an IC module for the processing of electrical signals; leads extending from said module, and contacts disposed on said leads; a carrier supportably engaging said IC module and disposed in the opening in the identification card body, the improvement comprising at least one readily flexible anchoring element having a high tensile strength and being of little thickness relative to the thickness of said identification card; said anchoring element being located adjacent to the carrier periphery and connecting said identification card body with said carrier.

4,463,972

PIPE COUPLING MEANS FOR CONNECTING TWO PIPE ENDS TO EACH OTHER

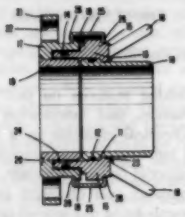
Karl Weinhold, Im Jagdfeld 43, 4040 Neuss, Fed. Rep. of Germany

Filed Dec. 8, 1981, Ser. No. 328,690

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1980, 3047457

Int. Cl.³ F16L *55/00*

U.S. Cl. 285—175 **10 Claims**



1. In a pipe coupling means for connecting two pipe ends to each other, a first one of said two pipe ends having an annular protrusion having an annular seal disposed in a radially extending surface of the protrusion, said coupling means being provided with a sliding sleeve with a radially inwardly extending shoulder thereof adapted to overlap said annular protrusion and said sliding sleeve being movable in an axial direction relative to said first one of said two pipe ends, said axial movement being limited in one direction by engagement of said annular protrusion with said radially inwardly extending shoulder; a sleeve section secured to a second one of said two pipe ends and being releasably secured to said sliding sleeve by outer shell means, said sliding sleeve and said sleeve section having an annular clamping protrusion and a radially outwardly protruding flange, respectively, and said outer shell means overlapping the annular clamping protrusion and the radially outwardly protruding flange when the outer shell means is closed to thereby retain said sliding sleeve and said sleeve section clamped together, said outer shell means comprising two halfshells hinged to one another and actuated to open and closed positions by a clamp lever closure, an improvement wherein the sleeve section surrounds in assembly a part of the sliding sleeve, said sleeve section having an inside diameter of a size allowing the second one of said two pipe ends, the inside diameter of which generally corresponds to that of said first one of said two pipe ends to be inserted into said sleeve section and secured thereto by securing means, the annular clamping protrusion of said sleeve section being disposed on the exterior thereof, and the sliding sleeve having an outer annular seal interacting with the interior of said sleeve section.

4,463,973

SEALED HINGE

Mark A. Westphal, Pittsburgh, Pa., assignor to Lee-Norse Company, Bristol, Va.

Filed Sep. 9, 1982, Ser. No. 416,292

Int. Cl.³ F16L *00/00, 55/00, 27/00;* **A47L** *9/24*

U.S. Cl. 285—298 **4 Claims**

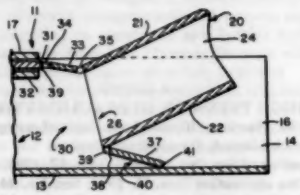
1. A duct assembly for mining machine dust control systems comprising:

a first duct section having one end adapted to be connected to a dust collection system and another end, having a bottom wall, and having a top wall terminating at a selected distance from said other end;

a second duct section adapted to be connected to a mining machine and having a top wall and a bottom wall having an end and moveable within the first duct section in a sliding arrangement;

an upper plate mounted to abut and slide with respect to the first duct section top wall and having an end extending outwardly of said first duct section top wall;

a connecting means for connecting the upper plate at its end to the second duct section top wall with a movable connection; and



a bottom plate connected with a moveable connection to the end of the second duct section bottom wall, said bottom plate having a length selected so that it rests against the first duct section bottom wall.

4,463,974

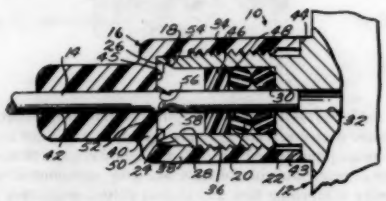
COUPLING WITH IMPROVED TUBE-GRIPPING MEMBER

Joseph Ergun, Itasca, Ill., assignor to Maremont Corporation, Carol Stream, Ill.

Filed Oct. 27, 1980, Ser. No. 201,158

Int. Cl.³ F16L *21/06*

U.S. Cl. 285—323 **4 Claims**



1. An air spring shock absorber adapted for automotive vehicles incuding a shock absorber body and a pressurized flexible air line tube having a tube end portion and a tube exterior of a tube exterior diameter size, the air spring shock absorber having the improvement of an air spring shock absorber air line coupling comprising:

a rigid nipple member being formed on the shock absorber body and including a tubular wall (**24**) having a free end, an exterior periphery, an interior frustoconical surface (**26**) converging inwardly with respect to said free end, a cylindrical surface (**28**) extending inwardly from said frusto-conical surface being of a diameter size substantially greater than the tube exterior diameter size, exterior threads on the exterior periphery, an inner passage (**32**) extending inwardly of said cylindrical surface into said shock absorber body and being of a diameter size to closely receive said flexible air line tube, and a first annular stop surface facing outwardly with respect to the free end of the tubular wall;

O-ring seal means in said rigid nipple member along said cylindrical surface for exteriorly sealingly engaging said cylindrical surface and interiorly sealingly engaging the tube exterior of the flexible air line tube;

a nut member including an end wall having a central aperture therein of a diameter size to closely receive said flexible air line tube therethrough and a peripheral wall extending axially from said end wall and having an interior periphery and interior threads on the interior periphery cooperatively engaging the exterior threads of said

nipple member, said nut member having a second annular stop surface cooperatively engaging the outwardly facing first annular stop surface of said nipple member;

a separate tube-gripping member in said rigid nipple member along said cylindrical surface and said frustoconical surface adjacent said O-ring means, including an annular wall portion (46) having an annular O-ring engaging end surface (48), an exterior peripheral surface of a diameter size less than the diameter size of said cylindrical surface of said nipple member and an interior peripheral surface of a diameter size to closely receive said tube, and a plurality of annularly spaced gripping finger portions (50) extending axially from the annular wall portion opposite from said annular O-ring engaging end surface, each of said finger portions including:

(i) an end wall engaging end surface (52) facing in a direction opposite from said annular O-ring engaging end surface,

(ii) an exterior segmental frustoconical surface (54) converging in a direction away from said end wall engaging end surface, all within the confines of said rigid nipple member,

(iii) an interior segmental frustoconical surface (56) having an inner end and coverging inwardly from said end wall engaging end surface to said inner end, all within the confines of said rigid nipple member;

(iv) an interior radially extending surface (58) extending inwardly of said interior peripheral surface; and

(v) barb structure located at the inner end of said interior segmental frustoconical surface and formed by said inner end and said radially extending surface, said barb structure adapted to dig into the exterior of said flexible air line tube;

the end portion of the air line tube being positioned through the central aperture of said nut member, through the interior peripheral surface of the separate tube-gripping member, through the O-ring seal means, and into the inner passage of the rigid nipple member;

the exterior and interior frustoconical surfaces of the separate tube-gripping member and the interior frustoconical surface of said nipple member each having an angle of inclination and extent being related with respect to the annular stop surfaces of said nipple and nut member such that the latter are in engagement by virture of the cooperative interengagement of said interior and exterior threads and the frustoconical surface of said nipple member and the segmental exterior frustoconical surface of the tube-gripping member are simultaneously in interengagement to effect a predetermined radially inward deformation of said gripping finger portions to push said barb structures into digging engagement with the end portion of the flexible tube extending through said end wall aperture within the cylindrical surface such that the coupling prevents outward movement of the flexible air line tube while the tube remains pressurized from the interior of the shock absorber and while said O-ring seal means provides a pressure-tight seal between said nipple member and said flexible tube.

4,463,975

BAND SEAL CLAMP

H. Lee McCord, Longview, Tex., assignor to Garlock, Inc., Longview, Tex.

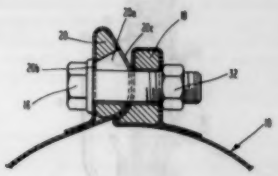
Filed Jan. 27, 1982, Ser. No. 343,315

Int. Cl.³ F16L *21/06*

U.S. Cl. 285—419 **6 Claims**

1. A band seal clamp for exerting a compressional force upon a cylindrical member when tightened, said clamp comprising:

a relatively wide, flat, elongated band of metal, said band having first and second ends, each of said ends being adapted to be assembled to and mate with a force bar member, the ends of said bands and the respective force bars having corresponding holes formed therein for passage therethrough of headed bolt means, at least one of said force bars having a reaction surface disposed at an angle other than the perpendicular to the axis of said bolt means, and said bars being shaped such that the outer portions of the assemblies of said force bars and the ends of said bands disposed away from said cylindrical member contact one another at initial assembly thereof, such that upon further tightening of said bolt means, an unbalanced force is exerted upon said at least one force bar by the head of said bolt causing it to rotate about an axis external to said cylindrical member to be clamped, wherein the



shapes of the holes in said force bar which is rotated vary from a generally circular cross-section sized to fit said bolt means at an end for entry of said bolt means to a substantially oval cross-section at the end from which said bolt means exits, so that upon tightening of said bolt means said force bar is substantially rotated generally about an axis passing through the point at which said bolt means contacts said hole at a point on the generally circular portion of its cross-section.

4,463,976

CASEMENT WINDOWS

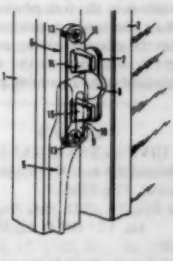
Jack E. Douglas, Walsall, England, assignor to Arthur Shaw Manufacturing Limited, West Midlands, England

Filed Nov. 8, 1982, Ser. No. 440,033

Claims priority, application United Kingdom, Nov. 20, 1981, 8135022

Int. Cl.³ E05C *3/04*

U.S. Cl. 292—202 **5 Claims**



1. In a casement window having a glazed sash mounted on a frame for relative movement by a hinge, a fastener comprising a lever handle mounted on a plate for pivotal movement from an intermediate release position to one of first and second securing positions spaced relatively by 180°, said handle mounting plate being secured to the hinged sash of the casement window for engagement with a keeper mounted on the adjacent casement frame, said keeper comprising a base plate having similar first and second spaced apart lugs projecting therefrom, each said lug being arranged for engagement by an abutment face of said lever when said lever is in a respective one of the said two securing positions with said abutment face being spaced from the pivot axis of said lever handle, whereby said lever handle may be moved from the released intermediate position when it clears the space intermediate said first and second lugs of the keeper to one of said first and second secur-

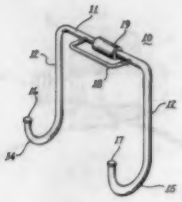
ing positions engaging respectively either said first or second lug to secure said sash to said frame.

4,463,977

CARRIER FOR LARGE PLANAR ARTICLES

James R. Wyatt, 5207 N. 33rd St., Phoenix, Ariz. 85018

Filed Feb. 14, 1983, Ser. No. 466,047
Int. Cl.³ B65G 7/12
U.S. Cl. 294—26 **2 Claims**



1. A carrier for facile placement under large planar articles and transportation of same above ground which comprises:

(a) a hand-grippable cross member having first and second ends and a central portion therebetween;

(b) first and second depending arms connected to said first and second ends respectively and being oriented to be substantially coplanar therewith for insertion in a first position under said article with said crossmember and arms adjacent the ground;

(c) first and second curved edge-receiving portions connected to said first and second depending arms respectively, said curved portions extending outwardly and upwardly from the plane of said arms and crossmember for receiving the edge of the article being transported when the carrier is in a second position; and

(d) a hand-grippable U-shaped spacing member affixed to said cross member proximate to the first and second ends thereof, the base of said spacing member extending upwardly from the central portion of the cross member when the carrier is in the first position, the application of a lifting force to said spacing member causing said carrier to rotate upon the edge-receiving portions to the second position whereby the edge of the article is moved to a position within said edge-receiving portions for transport.

4,463,978

DIVING TANK HANDLE

Craig S. Mountain, and Thomas D. Drunasky, both of P.O. Box 1083, Palm Harbor, Fla. 33563

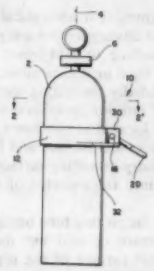
Filed Oct. 15, 1982, Ser. No. 436,859
Int. Cl.³ B65D 63/18
U.S. Cl. 294—31.2 **10 Claims**

1. A diving tank handle for selective attachment to a cylindrical diving tank, comprising:

a clamping ring having a substantially circular cross section with an inner diameter of slightly greater dimension than the outer diameter of of said diving tank, for slideably engaging the peripheral surface of said diving tank in an unclamped state and for frictionally engaging the peripheral surface of said diving tank in a clamped state, said clamping ring having an open side with a pair of opposed end surfaces;

a cam pivotally mounted to said clamping ring between said opposed end surfaces, on a pivot axis perpendicular to the cylindrical axis of said diving tank, said pivot axis being located at a pivot distance from said peripheral surface of said diving tank within said clamping ring, said cam having a first lobe with an actuating surface at a radial distance from said pivot axis which is slightly greater than said pivot distance, said first lobe being located on a first radius vector from said pivot axis, said cam having a clearance surface at a radial distance from said pivot axis which is slightly less than said pivot distance, said clearance surface being located on a second radius vector from said pivot axis, said second radius vector being angularly displaced by a clearance angle from said first radius vector, said cam having a second lobe with an actuating surface at a radial distance from said pivot axis which is substantially greater than said pivot distance and greater than said radial distance of said first lobe, said second lobe being located on a third radius vector from said pivot axis, said third radius vector being angularly displaced by a lifting angle from said first radius vector;

a handle portion mounted to said cam perpendicular to said pivot axis and at substantially a right angle to said first radius vector, for clamping said ring to said diving tank by rotating said cam to position said first lobe into contact with said peripheral surface of said tank when said handle portion is rotated into a storage position adjacent to said



peripheral surface of said tank and oriented substantially parallel with said cylindrical axis of said tank, said handle portion alternately freeing said ring for slidable engagement with said diving tank by rotating said cam to position said clearance surface proximate to said peripheral surface of said tank when said handle portion is rotated into a clearance position which is displaced by said clearance angle from said storage position, said handle portion alternately clamping said ring to said diving tank by rotating said cam to position said second lobe into contact with said peripheral surface of said tank when said handle portion is rotated into a lifting position which is displaced by said lifting angle from said storage position;

whereby said diving tank handle may be easily slipped onto said diving tank with said handle portion in said clearance position, compactly stored while mounted on said diving tank with said handle portion in said storage position and said diving tank carried with said handle portion in said lifting position.

4,463,979

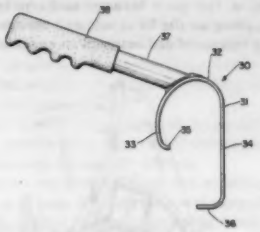
BUILDING BLOCK HANDLING TOOL

Arden F. Lybolt, Rte. 2, Tunkhannock, Pa. 18657

Filed May 12, 1983, Ser. No. 493,826
Int. Cl.³ B65G 7/12
U.S. Cl. 294—62 **8 Claims**

1. A device for handling a building block and the like comprising a rigid body portion comprising a substantially U-shaped having a curved base and a pair of legs of substantially equal length diverging therefrom at substantially a 45° angle, a handle extending longitudinally from an end of one of said legs, said handle being substantially horizontal and the other of said legs curving downwardly in the lifting position of the device, the length of said legs being such that the outer surface of the curved base and the end of said other leg engage opposed walls of said core, when said body portion and said other leg are

inserted into a core of a building block and the handle is directed toward the center of the building block whereby the



curved base of said body portion and the end of said other leg exert opposing forces on opposite walls of said core upon application of a lifting force to said handle.

4,463,980

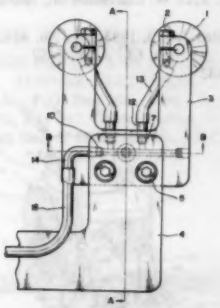
VACUUM SUCTION APPARATUS

Masaru Orii, c/o Kabushiki Kaisha Orii Jidoki Seisakusho, 22-12 Haginaka, 3-Chome, Ohta-Ku, Tokyo, Japan

Filed Mar. 2, 1982, Ser. No. 354,021

Int. Cl.³ B66C *1/02*

U.S. Cl. 294—64 R **1 Claim**



1. A vacuum suction apparatus which is adapted to facilitate replacement of the vacuum cups while maintaining suction air communicaton, comprising: two vacuum cups, means for supporting the vacuum cups, and an arm coupled to the cup supporting means by bolts so that the supporting means and the vacuum cups are detachable from the arm, an air channel having two vacuum hose connecting holes and one communicating hole being formed in the interior of said cup supporting means, another air channel having a vacuum hose connecting end and a communicating hole being formed in the interior of said arm, the vacuum hose connecting holes of the air channel in the cup supporting means being connected to vacuum hoses connected to the respective vacuum cups, the vacuum hose connecting hole of the air channel in the arm being connected to a vacuum hose connected to a vacuum source, the communicating holes in the supporting means and arm facing and being in alignment with each other and adapted to align with communicating holes of a replacement support means, an annular packing being formed around either of the two communicating holes at the interface of the supporting means and arm.

4,463,981

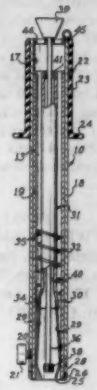
TELESCOPING PROD

Cecil G. Curry, 615 Kenridge Cir., Stone Mountain, Ga. 30083

Filed Jun. 10, 1982, Ser. No. 387,157

Int. Cl.³ B25B *9/00*

U.S. Cl. 294—100 **6 Claims**



1. A telescoping prod including an outer member having an opening therethrough, an inner member receivable within said opening through said outer member and slidable with respect thereto, said inner member being extendable from a first end of said outer member, the opposite end of said outer member defining a handle for said prod, means for selectively fixing the position of said inner member with respect to said outer member, pickup means carried by the extending end of said inner member, and operating means for selectively operating said pickup means, said operating means including an operating knob adjacent to said handle, said operating means further including a tubular member carrying said pickup means, a rod member slidable within said tubular member, said rod member carrying said operating knob at its rearmost end, the forward end of said rod member being selectively fixable to the rear end of said tubular member, the arrangement being such that said operating means can be telescoped to be the length of said outer member, and selectively extended for operating said pickup means.

4,463,982

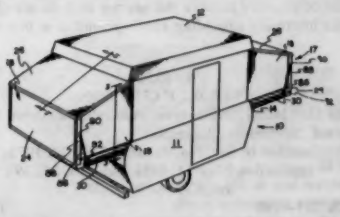
RETRACTABLE EXTENSION FOR A RECREATIONAL VEHICLE

John A. Irelan, Elkhart, Ind., assignor to Coachmen Industries, Inc., Middlebury, Ind.

Filed Jul. 12, 1982, Ser. No. 397,130

Int. Cl.³ B60P *3/34*

U.S. Cl. 296—170 **3 Claims**



1. A foldable and retractable extension for a recreational vehicle having a vertically raisable and lowerable roof structure comprising:

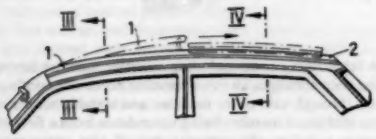
(a) a base panel, two side wall panels, one on each side of said base panel, means for mounting said side panels between a vertical in-use position and a horizontal stored position, an inclined raisable roof extension detachably associated with said roof structure, an end wall panel hingedly mounted on said base panel for pivotal movement between a vertical in-use position and a horizontal stored position, means connecting said roof extension to said end wall panel for pivotal and sliding movement of the roof extension relative to the end wall panel during pivotal movement of the end wall panel between its said vertical in-use and horizontal stored positions, and means for providing sliding of said side wall panels and end wall panel when in their said respective horizontal stored positions and said base panel and roof extension within the outline of said recreational vehicle.

4,463,983

VEHICLE ROOF WITH A MOVABLE PORTION

Edmund Hellriegel, Pulheim, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 17, 1982, Ser. No. 359,009
Int. Cl.³ B60J 7/18
U.S. Cl. 296—213 **4 Claims**



1. A vehicle roof having a frame, means defining an opening through the roof having leading and rear edges and a movable roof portion slidably movable over a fixed portion of the roof to uncover the opening, characterized in that lateral external drip mouldings having a laterally extending base surface are provided on the roof frame, elastic sealing means are carried on the drip moulding base surfaces, the movable roof portion is formed from a plastic as a sandwich-like component to substantially span the width of the roof and includes means defining lateral slide flanges slidingly receivable in the drip moulding, engaging the sealing means and being directly supported on the drip mouldings base surfaces through the sealing means, a flange is provided extending inwardly from the leading edge of the roof opening, a sealing strip is mounted on the flange, a bearing groove is defined on the leading edge of the movable roof portion for receiving the sealing strip to permit pivotal movement of the roof movable portion thereabout, an internally extending roof opening drip moulding is provided at the rear edge of the roof opening, a cross bar is provided proximate the rear edge of the movable roof portion, a sealing strip is carried on the cross bar to sealingly engage the internally extending roof opening drip moulding, and a detachable toggle hinge is operatively disposed between the fixed and movable portions of the roof to urge the sealing strip into engagement with the internally extending roof opening drip moulding.

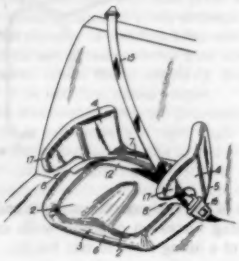
4,463,984

VEHICLE CUSHION

Thomas G. Molnar, Melbourne, Australia, assignor to Repco Limited, Melbourne, Australia

Continuation of Ser. No. 961,922, Nov. 20, 1978. This application May 11, 1981, Ser. No. 262,691
Int. Cl.³ A47D 1/10
U.S. Cl. 297—250 **16 Claims**

1. A cushion of form stable construction for use on a vehicle seat comprising a base for resting on a vehicle seat and having an upper seat surface, two arms on respective opposite sides of said base projecting from a rear portion of said base at a level above said seating surface and extending toward a front of said cushion so as to form two substantially forwardly extending arm rests on opposite sides along at least a front portion of their horizontal extent, the space between said arm rests and base forming an opening on the front side and the rear side of said cushion, and a recess defined between an undersurface of each



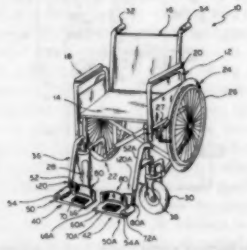
said arm rest and an adjacent part of said base for receiving at least a lap portion of a safety belt secured to the vehicle seat, each said recess having a mouth facing towards the front of said cushion, said arms being of sufficient rigidity to prevent substantial deflection by upward movement of said belt lap portion during a vehicle accident.

4,463,985

HEEL STRAP RETRACTOR FOR WHEEL CHAIR FOOT RESTS

Lutz T. Kynast, 1221 W. Clarendon St., Arlington Heights, Ill. 60004

Filed Jan. 3, 1983, Ser. No. 454,986
Int. Cl.³ A47C 7/50
U.S. Cl. 297—433 **5 Claims**



1. In a wheel chair foot rest assembly for securement to a wheel chair frame, with the assembly including a right angle shaped support member having an upright portion, adapted for pendant connection to the wheel chair frame adjacent the upper end of said portion, and a forwardly projecting arm adjacent the lower end of said upright portion in substantially normal relation thereto, a foot rest member journalled on said support member for swinging movement about said arm between an extended foot rest position to one side of said arm in which said foot rest member extends substantially normally of said support upright portion and defines an upper foot rest surfacing, and a retracted position in which said foot rest member is disposed along side said support upright portion in substantially parallel relation to said support upright portion, and a flexible heel strap extending across the rear of the foot rest member and having its ends anchored thereto forwardly of said support upright portion in substantially normal relation thereto to dispose the length of said heel between its said end along said foot rest surfacing for receiving in substantial

catenary fashion the heel of a patient's foot resting in the foot rest member surfacing when the latter is in its extended position, with one of the strap ends being disposed adjacent said support upright portion,

the improvement comprising a retractor for said heel strap for disposing said length of the strap forwardly of said support upright portion on swinging of said platform from said extended position to said retracted position,

said retraction comprising:

a resiliently flexible spring filament device including:

a helically contoured spring wind up socket portion received about said support upright portion,

a lower open loop portion connected to said socket portion and being in snap fit relation to said support arm,

and an upper finger connected in spring wind up relation to said socket portion and having a projecting camming end received against the rear side of said strap in sliding relation thereto adjacent said one end thereof in spring wind up relation of said socket portion for spring biasing said arm against said strap,

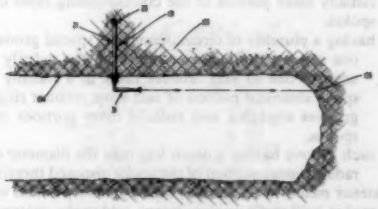
whereby on movement of said foot rest member from said extended position to said retracted position, said heel strap length in moving with said foot rest member is cammed by said finger to be disposed forwardly of said support upright portion.

4,463,986

ILLUMINATION DEVICE AND METHOD OF USE IN TUNNEL ALIGNMENT

George Sodder, Jr., P.O. Box 306, Alloy, W. Va. 25002, and Dominick Costa, Box 547, Gauley Bridge, W. Va. 25085

Filed Dec. 8, 1981, Ser. No. 328,714
Int. Cl.³ E21D *9/00*
U.S. Cl. 299—1 **22 Claims**



12. A method of verifying a vertical center plane of boring an underground mine passageway, comprising the steps of:

securing a first portion of an illumination device against rotation relative to a wall of the passageway;

rotating a second portion of the illumination device containing a light source for producing a concentrated directional light beam, said second portion being rotatable in a direction substantially about a vertical axis;

pivoting the second portion about an axis perpendicular to the longitudinal axis of the first portion; and

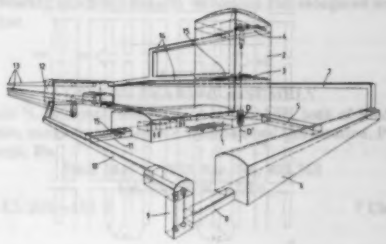
securing the vertical portion in a predetermined angular position relative to the vertical axis indicative of the desired center plane such that the light beam shines at an end wall of the passageway to indicate the center plane of boring.

4,463,987

SYSTEM FOR UNDERSEA RECOVERY OF HYDROCARBONS

Terje Berg, Asker; Troad Hübertz, Drammen; Erland Kleiven, and Ivar Torblaa, both of Oslo, all of Norway, assignors to Ingeniør A.B. Berdal A/S, Sandvika; Ingeniør Thor Furuholmen A/S, Oslo and Sivilingeniør Nybro Hansen A/S, Høvik, all of, Norway

Continuation of Ser. No. 93,038, Nov. 9, 1979, abandoned. This application Jul. 31, 1981, Ser. No. 288,914
Claims priority, application Norway, Nov. 14, 1978, 783815
Int. Cl.³ E21B *7/12*
U.S. Cl. 299—2 **4 Claims**



1. A system for the undersea recovery of hydrocarbons which comprises

a first underground chamber located below the seabed which is sufficiently large to house hydrocarbon development apparatus and to allow for operation thereof by attendant personnel,

hydrocarbon development apparatus located in said first underground chamber, said hydrocarbon development apparatus being connected to a hydrocarbon tapping circuit extending generally downwardly from the first underground chamber toward an undersea hydrocarbon deposit,

a second underground chamber located near said first underground chamber and away from said hydrocarbon tapping conduit, said second underground chamber having an elongated shape and being generally horizontally oriented, said second underground chamber having opposite ends and top and bottom walls,

a conduit means connected between said first underground chamber and said second underground chamber between its opposite ends so as to cause any hydrocarbons accumulating in said first underground chamber to be drained into said second underground chamber,

a first outlet means connected to the top wall of said second underground chamber near a first of its opposite ends to vent hydrocarbon gases accumulated in said second underground chamber, and

a second outlet means connected to the bottom wall of said second underground chamber near a second of its opposite ends to drain hydrocarbon liquids accumulated in said second underground chamber.

4,463,988

HORIZONTAL HEATED PLANE PROCESS

Larry S. Bouck; Erhan Ozey, and Richard E. Worsham, all of Tulsa, Okla., assignors to Cities Service Co., Tulsa, Okla.

Filed Sep. 7, 1982, Ser. No. 415,206
Int. Cl.³ E21B *43/26*; E21C *41/10*
U.S. Cl. 299—2 **31 Claims**

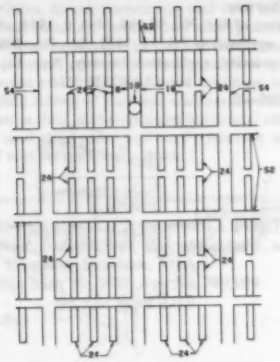
1. A horizontal heated plane process for in situ recovery of a resource from a subsurface resource formation comprising:

(a) forming a plurality of lateral bore holes in the lower portion of the resource formation;

(b) injecting a heated displacing means into said bore holes to permeate the resource therein causing the resource to

become less viscous and gravity flow into the lower portion of said bore holes;

(c) continuing to inject heated displacing means into said bore holes such that the resource located in interstitial crevices between said bore holes is removed, allowing the heated displacing means to flow laterally through the



interstitial crevices vacated by the resource and into adjacent bore holes, and

(d) allowing the heated displacing means to rise toward the upper portion of the resource formation to create a horizontal heated plane of communication, thus improving the removal of the resource therein.

4,463,989

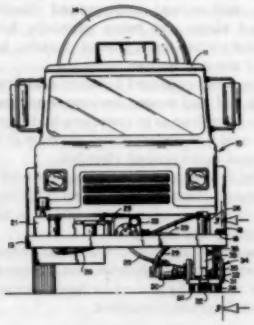
DEVICE FOR CUTTING A RECEPTACLE IN PAVEMENT TO RECEIVE PLOWABLE REFLECTORS

Ralph Kennedy, 27 W. Jenkins Ave., Columbus, Ohio 43207

Filed Dec. 7, 1981, Ser. No. 328,288

Int. Cl.³ E01C *23/09*

U.S. Cl. 299—39 **8 Claims**



1. A device for cutting a receptacle in the surface of pavement, said receptacle being adapted to receive a plowable headlight reflector, comprising

support means positioned on said pavement,

means associated with said support means for moving said support means from place to place,

a container on said support means adapted to house cutting and cooling fluid,

a rotary cutting means depending from said support means and of a width adapted to cut a receptacle in the surface of said pavement of a size adapted to receive a plowable headlight reflector and supported on an axis capable of being tilted,

a hydraulic pump,

a hydraulic motor operated by said hydraulic pump and operatively connected to said cutting means,

means for raising and lowering said rotary cutting means into engagement with the surface of said pavement on which said support means is positioned, and

means, engaging the surface of said pavement, for automatically tilting the axis of rotation of said rotary cutting means so that said rotary cutting means performs its cutting function while at right angles to the tangent to that portion of the surface in which said receptacle is to be cut.

4,463,990

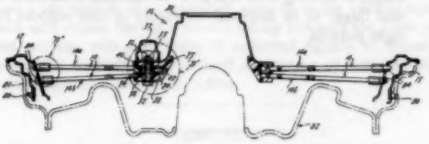
SIMULATED WIRE WHEEL TRIM AND METHOD

Hans R. Beisch, North Amherstburg, Canada, assignor to NI Industries, Inc., Novi, Mich.

Continuation of Ser. No. 015,632, Feb. 27, 1979, abandoned, which is a continuation-in-part of Ser. No. 885,672, Mar. 13, 1978, abandoned. This application Aug. 24, 1981, Ser. No. 526,265

Int. Cl.³ B60B *7/04*

U.S. Cl. 301—37 SS **7 Claims**



1. Wheel trim for attachment to the outer face of a vehicle wheel comprising:

an annular retainer flange having means for engaging said vehicle wheel, said retainer flange having a spoke retainer flange portion with at least one row of a plurality of circumferentially spaced generally circular apertures;

at least one layer of a plurality of generally radially extending spokes;

a hub having a radially outwardly extending support flange;

spoke retainer means attached to said hub at said support flange, comprising at least two annular spoke retainer rings positioned axially adjacent on opposite sides of the radially inner portion of the corresponding layer of said spokes,

having a plurality of circumferentially spaced grooves on one support surface extending from the radially outer edge of one of said retainer rings to a radially inner spoke abutment portion of said same retainer ring, said grooves engaging said radially inner portions of said spokes,

each groove having a depth less than the diameter of the radially inner portion of the spoke disposed therein; and

fastener means to secure said radially inner portions of said spokes, said spoke retainer means, said spoke retainer ring, and said hub together.

4,463,991

RELEASE VALVE APPARATUS FOR INDIRECT AIR BRAKES OF RAIL VEHICLES

Erich Huber, and Johann Huber, both of Munich, Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 472,818

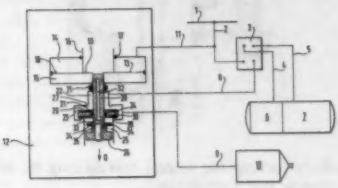
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1982, 3208498

Int. Cl.³ B60T *15/04*

U.S. Cl. 303—69 **9 Claims**

1. Release valve apparatus for indirect air brakes of rail vehicles actuated by the vacuum that can be induced in a main air line (1), with a release valve (12) arranged in a connection

(4 or 5; 8, 9) leading from an air reservoir (6) via a brake control valve (3) and possibly a relay valve to a brake cylinder (10), said release valve (12) in its off position opening a passage belonging to said connection (4 or 5, 8, 9), said release valve in its operative position closing said passage and connecting the brake cylinder segment of said connection (pipe 9) to atmosphere and having a two-way valve (24, 27, 28) switchable by a piston (13) to switch said passage and the connection to atmosphere, said piston (13) separating two admission areas (14, 15) lying opposite one another, one (14) of said admission areas, when impacted by pressure, loading said piston (13) in the switching direction of said two-way valve (24, 27, 28) to



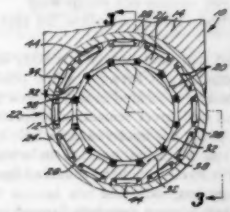
open said passage, being always connected to the main air line (1), the other said admission area (15) being impacted by pressure in a line segment (pipe 9) of said connection (4 or 5; 8, 9) leading to said brake control valve (3) only when said passage is closed and during switching procedures, and otherwise is discharged, said release valve (12) being in that area (pipes 8, 9) of said connection (4, or 5, 8, 9) which lies between said brake control valve (3) and said brake cylinder (10), and comprising a device permitting switching back from the operative position to the off position when the pressure in the main air line (1) rises only if said brake control valve (3) is in the release position.

4,463,992

HIGH CAPACITY NEEDLE BEARING FOR LINEAR MOTION ON A SHAFT

Otto R. Heine, Poway, Calif., assignor to R & H Technology Inc., Minneapolis, Minn.

Filed Nov. 15, 1982, Ser. No. 441,493
Int. Cl.³ F16C *29/06*
U.S. Cl. 308—6 C **20 Claims**



1. A bearing assembly adapted for low friction linear motion on an elongated member including at least one curvilinear bearing surface having a substantially uniform cross-sectional area taken in a plane perpendicular to the longitudinal axis of the elongated member, the assembly comprising:

a housing;

a bearing race assembled to the housing so as to be capable of transmitting a load carrying force to said housing, the bearing race configured for enveloping the cross-sectional area of the bearing surface of the elongated member; one of the elongated member and the bearing race having a plurality of curvilinear bearing surfaces which have substantially identical curvature with the bearing surface of the other of said elongated member and bearing race;

a plurality of circumferentially disposed load carrying roller members disposed in the housing, each of said roller members having a curvilinear surface which is substantially complementary and capable of rolling on the respective curvilinear surfaces of the elongated member and of the bearing race in intimate area rolling contact therewith, a substantial portion of said roller members being disposed in a space between the bearing race and the elongated member when the bearing assembly is mounted to the elongated member, the bearing race and the housing jointly comprising means for substantially continuously circulating said roller members for rolling contact with the bearing race and with the elongated member while the bearing assembly linearly moves on the elongated member.

4,463,993

CENTER BEARING ASSEMBLY

Ronald N. Brissette, and Richard L. Kumbier, both of Medina, Ohio, assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 9, 1983, Ser. No. 492,763
Int. Cl.³ F16C *27/06*
U.S. Cl. 308—184 R **7 Claims**

1. A rotary bearing for a vehicle drive shaft comprising a bracket extending partly around said shaft and having a pair of spaced legs with each said leg terminating in means for securing said bracket to a fixed support, said bracket having an inner surface of substantial axial width;

a resilient support having an aperture extending axially therethrough and an outer peripheral surface substantially complimentary to and in abutment with the periphery of said inner surface;

an anti-friction bearing seated in said resilient support aperture;

a plurality of tabs folded inwardly from said bracket adjacent each side of said resilient support to prevent axial movement of said support relative to said bracket; and

means securing said support against withdrawal from between said bracket legs in a direction substantially normal to the axis of said support opening.

4,463,994

SPLIT INNER RACE BEARING

Robbin D. Eliason, Pomfret Center, and Claude P. Rotondo, Middletown, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Mar. 22, 1982, Ser. No. 360,255
Int. Cl.³ F16C *33/60, 33/10*
U.S. Cl. 308—196 **3 Claims**

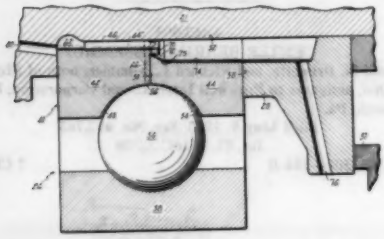
1. A bearing which comprises:

a split inner race including a first annular race half and a second annular race half axially adjacent said first race half;

said second race half having generally radially extending first and second opposed surfaces;

said first race half having an outer circumferential surface, an inner circumferential surface, and a generally radially extending surface contiguous with said first surface of said second race half and including lip means extending axially outwardly therefrom proximate said inner circumferential surface thereof;

said inner circumferential surface of said first race half having a plurality of circumferentially spaced apart axial grooves therein, and said radially extending surface of said first race half having a plurality of circumferentially spaced apart radial slots therein each intersecting one of



said axial grooves and extending from said intersected axial groove to said outer circumferential surface, wherein at least a first plurality of said axial grooves do not intersect said radial slots and extend axially across said lip means; and

said second race half including an annular trough having a base and an edge, said edge being located radially inwardly of said base, and said trough, including said trough edge, being radially aligned with and disposed radially outwardly of said lip means for receiving fluid from said first plurality of axial grooves, said second race half also including a plurality of fluid carrying passageways in communication with said trough and extending from said trough to said second surface.

4,463,995

SAFETY MOUNTING FOR LARGE ANTIFRICTION BEARINGS

Dietrich Andree, Dortmund, Fed. Rep. of Germany, assignor to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Dec. 16, 1982, Ser. No. 450,288

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151277

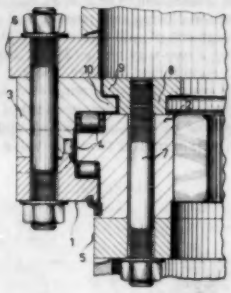
Int. Cl.³ F16C *19/34*

U.S. Cl. 308—207 R **14 Claims**

1. Safety mounting for large antifriction bearings comprising a first bearing ring;

rolling members disposed at the bearing ring;

a second bearing ring engaging the rolling members such that the second bearing ring can rotate versus the first bearing ring; a circular radial projection disposed on the second bearing ring on the side located toward the first bearing ring and extending coaxially relative to with the bearing axis; and combined attachment and retainer provision disposed at the first bearing ring on the side toward the second bearing ring for forming an opening means and



positively locking the second bearing ring by matching the circular radial projection.

4,463,996

TAPE CASSETTE STORAGE BOX

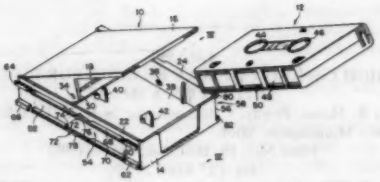
Shoichi Saito, and Hideo Shirako, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 4, 1981, Ser. No. 318,037

Claims priority, application Japan, Nov. 11, 1980, 55-160966[U]

Int. Cl.³ A47B *81/06;* **F16B** *12/00*

U.S. Cl. 312—9 **17 Claims**



1. A tape cassette storage box comprising:

a storage box body having a hollow for receiving a micro cassette;

a cover coupled with said storage box body so as to be able to rotate about an axis between a first position in which the micro cassette is located in said hollow of said storage box body and said cover houses, in cooperation with said storage box body, the micro cassette held in said storage box body, and a second position in which said cover allows said micro cassette to be removed from said hollow of said storage box body; and

a pair of reel hub stopper members formed on said storage box body and arranged in a direction which crosses the axis of rotation of said cover so as to be able to engage a pair of reel hubs of the micro cassette held in said hollow of said storage box body, wherein said pair of reel hubs are prevented from rotating,

the height of that one of said pair of reel hub stopper members which is nearer to said axis of rotation being lower than the height of the other one of said pair or reel hub stopper members;

the storage box body having first and second rectangular lateral faces intersecting the axis of rotation of the cover, first engaging means formed on the first lateral face out of the two rectangular lateral faces of said storage box intersecting the axis of rotation of said cover, and second engaging means formed on a second lateral face of said storage box body;

said first engaging means including a first engaging click disposed in a first corner region of said first lateral face, a second engaging click disposed to be isolated from said first engaging click in a second corner region of said first lateral face located in a direction substantially at right angles to the direction for engagement of said first engaging click and having the same length and the same direction for engagement as those of said first engaging click, a third engaging click disposed to be isolated from said first engaging click in a third corner region of said first lateral face located in the direction for engagement of said first engaging click and having the same length and the same direction for engagement as those of said first engaging click, and a fourth engaging click disposed to be isolated from said third and second engaging click in a fourth corner region of said first lateral face located in a direction substantially at right angles to the direction for engagement of said third engaging click and in the direction for engagement of said second engaging click and having the same length and the same direction for engagement as those of said first engaging click; and

said second engaging means including a first engaged click disposed in a first corner region of said second lateral face, a second engaged click disposed to be isolated from said first engaged click in a second corner region of said second lateral face located in a direction substantially at right angles to the direction for engagement of said first engaged click and having the same length and the same direction for engagement as those of said first engaged click, a third engaged click disposed to be isolated from said first engaged click in a third corner of said second lateral face located in the direction for engagement of said first engaged click and having the same length and the same direction for engagement as those of said first engaged click, and a fourth engaged click disposed to be isolated from said third and second engaged clicks in a fourth corner region of said second lateral face located in a direction substantially at right angles to the direction for engagement of said third engaged click and in the direction for engagement of said second engaged click and having the same length and the same direction for engagement as those of said first engaged click;

the first to fourth engaging clicks of the first engaging means of a first tape cassette storage box engaging the first to fourth engaged clicks of the second engaging means of a second tape cassette storage box when the first engaging means of said first tape cassette storage box is coupled with the second engaging means of said second tape cassette storage box;

the first and third engaging clicks of said first engaging means protruding from said first lateral face substantially at right angles thereto with their projected ends bent away from said second and fourth engaging clicks to extend substantially in parallel with said first lateral face;

the second and fourth engaging clicks of said first engaging means protruding from said first lateral face substantially at right angles thereto with their projected ends bent away from said first and third engaging clicks to extend substantially in parallel with said first lateral face;

the first and third engaged clicks of said second engaging means protruding from said second lateral face substantially at right angles thereto with their projected ends bent toward said second and fourth engaged clicks to extend substantially in parallel with said second lateral face; and

the second and fourth engaged clicks of said second engaging means protruding from said second lateral face substantially at right angles thereto with their projected ends bent toward said first and third engaged clicks to extend substantially in parallel with said second lateral face.

4,463,997

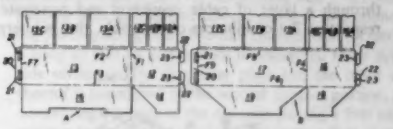
KNOCKDOWN STORAGE UNIT

Mark S. Densen, 18 Blackburn Pl., Summit, N.J. 07901

Filed Jun. 7, 1982, Ser. No. 385,530

Int. Cl.³ A47B *43/02*

U.S. Cl. 312—259 **13 Claims**



1. A knock down storage unit having opposed side and end walls formed of readily foldable cardboard material comprising a pair of blanks formed of sheet material, each of said blanks having opposed transverse edge portions and a transversely extending foldline disposed intermediate said edge portions about which each of said respective blanks can be folded to define a side wall and an adjacent end wall of said unit in the assembled position of said blanks, complementary interlocking means connected to the respective edge portion of said blanks whereby the edge portion of one blank can be secured to the adjacent edge portion of the other blank in the assembled position of said box, said complementary locking means including a marginal flap hingedly connected about a foldline coincident to one edge portion of said blank, a first locking tab blanked out of said marginal flap and defining a slot in said marginal flap, and a second locking tab connected to the other edge portion of said blank, said second locking tab having a slot formed therein whereby said second locking tab engages said slot formed in said marginal flap defined by said first locking tab blanked out of the marginal flap of one blank, and said first locking tab is fitted to the slot of said second locking tab connected to the adjacent edge of the other blank for maintaining the respective blanks locked in their assembled rectilinear shape, wherein said first locking tab blanked out of said marginal flap includes a T shaped tab having a cross-head portion and a stem portion, said cross-head portion being hingedly connected to said marginal portion about said foldline spaced from said one edge of said blank.

4,463,998

CONNECTOR ASSEMBLY FOR UNDERCARPET CABLE

Robert P. Reavis, Statesville; Mickey L. Mayberry, Winston-Salem; David Willette, Pfafftown; Lawrence P. Weisenburger, and Reginald A. Bates, both of Kernersville, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 354,839, Mar. 4, 1982, abandoned. This application Sep. 28, 1983, Ser. No. 536,593

Int. Cl.³ H01R *13/447*

U.S. Cl. 339—40 **4 Claims**

1. An electrical connector for undercarpet flat and flexible cable that includes one or more flat electrical conductors contained in a flexible sheath of insulating material, comprising;

a planar metal plate having a plurality of lands raised in relief,

an insulative terminal block constructed to overlie selected lands of the plate with an undercarpet flat and flexible cable interposed between the block and the selected lands overlaid by the block,

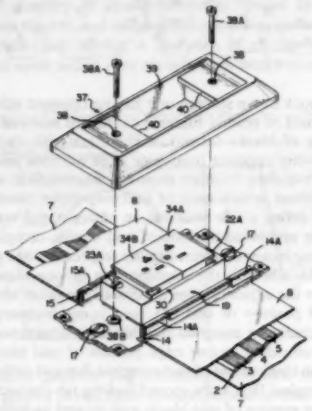
mounting feet projecting from the block and constructed for locked registration with selected lands of the plate,

the block having terminal receiving cavities extending from one side of the block to a second side,

electrical terminals in the cavities of the block, the terminals having electrical receptacle portions opening toward the first side of the block and conductor terminating portions emerged from the cavities and overlying against the second side of the block,

lances on the conductor terminating portions, the lances facing outwardly away from the second side of the block,

a conductive fastener carried by the block and constructed to mechanically secure in one of the lands overlaid by the block and apply the block and the overlaid lands in clamped relationship on the cable, the block urging the lances of the conductor terminating portions to penetrate through a layer of cable insulation and penetrate into respective flat conductors of the cable, that is interposed



between the block and the overlaid lands of the plate, thereby to establish electrical connections between the lances and the respective flat conductors, the conductive fastener constructed further to mechanically secure in one flat conductor of the cable,

a cover having a hollow interior receiving the block therein, and

fasteners carried by the cover and constructed to secure in selected lands of the plate.

4,463,999

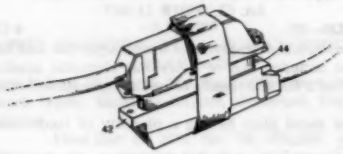
ELECTRICAL CONNECTOR HOLD-DOWN ADAPTOR

Robert H. Knickerbocker, Cheshire, Conn., assignor to The Siemon Company, Watertown, Conn.

Continuation-in-part of Ser. No. 145,621, May 1, 1980, Pat. No. 4,343,525. This application Apr. 5, 1982, Ser. No. 365,200

Int. Cl.³ H01R *13/639*

U.S. Cl. 339—75 P **9 Claims**



1. A retainer for releasably securing together a pair of mating electrical cable connectors, the cable connectors each having a body portion and a connection portion extending outwardly therefrom, the connection portions being adapted to mate with each other, said retainer comprising:

a rigid bracket, said bracket having a substantially planar base portion and at least a first arm extending outwardly from said base portion at an angle, said arm having a slot extending therethrough, said base portion having an aperture extending therethrough, said aperture having a size and shape which permits the connector extensions to pass therethrough, said aperture having a crosssectional area which is smaller than the cross-sectional area of the connector body portions, said bracket being intended for positioning between a pair of connectors; and

a flexible strap, said strap including a first portion having loops extending outwardly from a first side thereof and a second portion having flexible hook members extending outwardly from a second side thereof, said hooks and loops cooperating when brought into contact to releasably secure said first strap portion to said second strap portion after said flexible strap is wrapped around both of a pair of connectors, said strap further being folded on and permanently secured to itself to form a loop at a first end thereof, said strap passing through said slot in said bracket arm in the region of said loop whereby said strap is attached to said bracket.

4,464,000

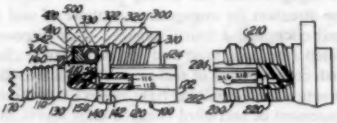
ELECTRICAL CONNECTOR ASSEMBLY HAVING AN ANTI-DECOUPLING DEVICE

Dee A. Werth, Afton, and Vincent A. Luca, Jr., Sidney, both of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Sep. 30, 1982, Ser. No. 431,992

Int. Cl.³ H01R *13/629*

U.S. Cl. 339—89 M **10 Claims**



1. An electrical connector assembly having an anti-decoupling device comprising: first and second shells (**100**, **200**), said first shell (**100**) having an annular wall (**130**) circumjacent an annular shoulder (**140**); a coupling nut (**300**) having an inner wall (**322**) and an end wall (**342**) rotatably mounted to said first shell (**100**) and including thread (**310**) connectable with corresponding thread (**210**) on the second shell (**200**) for interconnecting the shells, a spring cavity (**330**) being formed between end wall (**342**) and annular shoulder (**140**) and between annular wall (**130**) and inner wall (**322**); and an anti-decoupling device for retarding rotational movement of the coupling nut (**300**) relative to the interconnected shells, said anti-decoupling device characterized by:

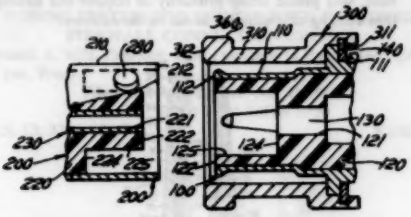
an annular ring (**400**) clearance fit for sliding about first shell (**100**) and having and end face (**410**) in abutment with end wall (**342**) and a forward tapered face (**420**); and

a helical coil spring (**500**) formed into an annulus and disposed within spring cavity (**330**), the inner surfaces of each coil of the spring being snugly fit about annular wall (**130**), coupling rotation advancing end wall (**342**) longitudinally forward against annular ring (**400**) and forward tapered face (**420**) thereof into abutment with coil spring (**500**) to squeeze the coil spring into abutment with annular shoulder (**140**) and cam the annulus radially from snug contact with annular wall (**130**) upwardly against inner wall (**322**) of the coupling nut, friction developed between coils squeezed together and squeezed against inner wall (**322**), tapered face (**420**) and annular shoulder resisting rotation of the coupling nut.

4,464,001
COUPLING NUT HAVING AN ANTI-DECOUPLING DEVICE

Gordon T. Collins, Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 30, 1982, Ser. No. 430,905
Int. Cl.³ H01R *13/625*
U.S. Cl. 339—90 R **9 Claims**



1. An electrical connector assembly having an anti-decoupling device comprising: first and second shells (**100, 200**) with each including, respectively, a dielectric insert (**120, 220**) and said second shell (**200**) further including a radially extending coupling pin (**280**) on an outside portion thereof; a coupling nut (**300**) rotatably disposed about said first shell (**100**) and including a longitudinal guideway (**148**) for receiving the coupling pin (**280**); and an anti-decoupling device for preventing unwanted disconnection between the shells, said anti-decoupling device characterized by a first end face (**124**) associated with said first shell (**100**) being adapted to abut a second end face (**222**) associated with said second shell (**200**) for limiting axial advance of the shells but allowing continued rotation of the coupling nut; said coupling nut (**300**) including a slot arrangement for receiving the coupling pin and including a longitudinal slot (**146**) and first and second laterally extending slots (**142, 144**) joined at their adjacent ends by the longitudinal slot (**146**), said first lateral slot (**142**) being joined at its other end to the guideway (**148**), said slot arrangement forming integrally of the coupling nut (**300**) a deflectable latch spring (**160**) including a detent (**162**) formed thereon for receiving and securing said coupling pin (**280**), longitudinally advancing the coupling nut (**300**) causing the end faces (**124, 222**) to abut and the coupling pin (**280**) to be presented into the first lateral slot (**142**) and against the latch spring (**160**), rotating the coupling nut driving the coupling pin against the latch spring and the latch spring to deflect rearward whereby the coupling pin advances to the detent, whereupon the latch spring deflects forward and the detent captivates the coupling pin.

4,464,002
ELECTRICAL CONNECTOR

Hiroyuki Suzuki, Machida; Ikuhiro Andoh, Kawasaki, and Kouji Watanabe, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 29, 1981, Ser. No. 268,644
Claims priority, application Japan, May 29, 1980, 55-72033; May 29, 1980, 55-74480[U]
Int. Cl.³ H01R *13/38*
U.S. Cl. 339—97 P **3 Claims**

1. An electrical connector comprising:

(a) a plurality of contacts, each of said contacts including

(i) a first contact portion for mating with another connector contact, said first contact portion being formed along a first axis, being of a cylindrical construction, and having a butting portion, a supporter plate projecting along the first axis as a body extending upwardly from an upper end of the cylindrical first contact portion, and a rotation stopper projecting from a side of said supporter plate along an axis substantially perpendicular to the first axis;

(ii) a second contact portion for connecting with a conductor of a flat cable, said second contact portion being formed along a second axis parallel with and spaced a predetermined distance from the first axis, and having at least a pair of contact pieces with a slit formed therebetween and a tapering projection extending from a lower end of said second contact portion along the second axis with a taper at the lower end thereof; and

(iii) a connecting portion for connecting said first contact portion with said second contact portion, said connecting portion being of a plate-like construction formed as a body so that an end thereof is connected to an upper side surface of the supporter plate and the other end thereof is connected to the second contact portion, the connecting portions of the contacts having a first angle relative to the first axes of said respective first contact portions and a second angle relative to the respective second axes of said respective second contact portions; and

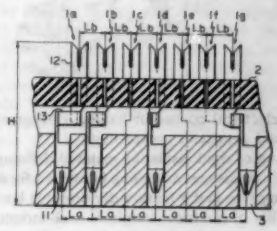
(b) at least one insulator member having a plurality of means for receiving corresponding contacts, each means including

(i) a first hole for accommodating said first contact portion of said contact;

(ii) a second hole for accommodating said second contact portion of said contact;

(iii) a guide groove for inserting said contact and joining the first hole to the second hole; and

(iv) a guide hole connected to said first hole for accommodating the rotation stopper, said first holes and second holes of said plurality of receiving means being arranged so that of said first contact portions and said second contact portions have different by inserting said contacts into said guide grooves and by bending said connecting portions of said contacts in planes substantially perpendicular to said first and second axes and when the connecting portion is bent, the first angle of the connecting portion relative to the first axis of said first contact portion and the second angle of the connecting portion relative to the second axis of said second contact portion is selectively changed for each of the contacts; and



wherein said rotation stopper aligns the position of the butting portion of the first contact portion by stopping the rotation of the first contact portion around the first axis, cooperating with the guide hole and supporting the supporter plate so that a predetermined first angle between said connecting portion and the supporter plate is fixed when said first contact portion and the rotation stopper are inserted into the first hole and the guide hole, respectively, and then the tapering projection guides the insertion of said second contact portion by entering the tapering projection into the second hole prior to said second contact portion so that a predetermined second angle between said connecting portion and said second contact portion is fixed when said second contact portion is inserted into the second hole, the predetermined first and second angles being set for each contact so that pitch among said first contact

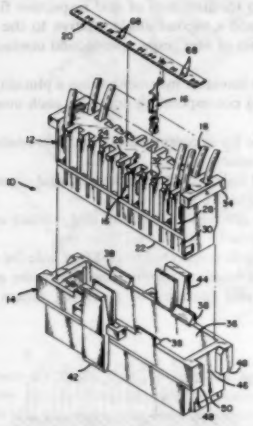
portions is different from the pitch among said second contact portions.

4,464,003

INSULATION DISPLACING CONNECTOR WITH PROGRAMMABLE GROUND BUSSING FEATURE

Joseph R. Goodman, Lake City; John A. Woratyla, Camp Hill, and Dale R. Zell, Elizabethtown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 1, 1982, Ser. No. 437,998
Int. Cl.³ H01R *13/39*
U.S. Cl. 339—99 R **11 Claims**



6. An electrical connector having a programmable ground feature, said connector comprising:

a housing of rigid insulative material defining a plurality of terminal passages extending between a forwardly directed mating face and a rearwardly directed bussing surface;

a plurality of electrical terminals each mounted in a respective passage with a mating portion directed towards said mating face, an intermediate insulating piercing conductor engaging portion, and a detachable bussing portion extending at an angle to the axis of the terminal to lie on said bussing surface; and

a buss bar receivable on said bussing surface and adapted to electrically and mechanically engage the bussing portion of the respective terminals.

4,464,004

SEPARABLE ELECTRIC CONNECTOR MODULE WITH GAS-ACTUATED PISTON

Steven M. Hegyi, Hickory, N.C., and Joseph A. St. Jacques, Shreveport, La., assignors to General Electric Company, King of Prussia, Pa.

Filed Apr. 8, 1982, Ser. No. 366,496
Int. Cl.³ H01R *13/52*
U.S. Cl. 339—111 **4 Claims**

1. A separable electrical connector module adapted to conduct current between a mating connector module and an externally-threaded bushing well stud, comprising:

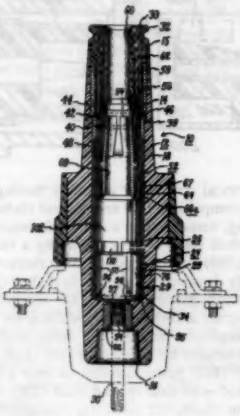
(a) an insulating housing having an elongated receiving passageway therein;

(b) a rigid container tube of aluminum closely fitted within said receiving passageway and having an outer end for receiving a rod contact member of the mating connector module and an inner end located adjacent said bushing well stud;

(c) a snuffer tube in said container tube having a central bore for receiving said rod contact member and having ablative material inside said bore;

(d) a bore contact member normally located intermediate the ends of said container tube;

(e) a piston fixed to said bore contact member and adapted to drive said bore contact member along the axis of said container tube toward said outer end of the container tube in response to gas generated by arcing in said snuffer-tube bore, said piston being primarily of copper but having a thin coating of dissimilar metal on its exterior;



(f) a sleeve of copper tightly fitting within said container tube, said sleeve acting as a cylinder for slidably receiving the exterior of said piston in contacting relationship between copper and said dissimilar metal, said sleeve having adjacent the inner end of said container tube an integrally-formed end wall containing a central opening; and

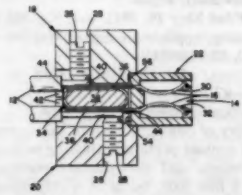
(g) a copper-alloy nut brazed to said end wall adjacent said central opening, said nut having internal threads adapted to mesh with threads on said externally-threaded bushing well stud.

4,464,005

TEMPERATURE STABILIZED ELECTRICAL CONNECTOR

John L. Dwight, Andover, Mass., assignor to Precision Connector Designs, Inc., Winchester, Mass.

Filed May 24, 1982, Ser. No. 381,020
Int. Cl.³ H01R *13/00*
U.S. Cl. 339—112 R **8 Claims**



1. An electrical connector comprising

a body of insulating material,

two rows of electrically-conducting contacts mounted on said body, said contacts defining an insertion region between opposing portions of first ends of said contacts, each said row having wire connection portions spaced from said opposing portions and defining a plane,

a plurality of electrical wires, each touching a respective said contact at its wire connection portion, and

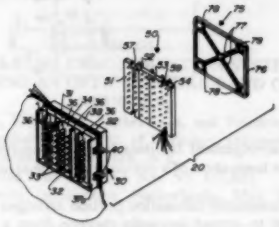
an elongated heat-conducting, electrically-insulating member mounted between said rows and contacting said electrical contacts to maintain said contacts in both rows at the same temperature.

4,464,006

WIRING SYSTEM FOR TRUCKS WITH IMPROVED FIREWALL CONNECTION SYSTEM

Donald A. Wilt, Fremont, Calif., assignor to Paccar Inc., Bellevue, Wash.

Filed Sep. 3, 1982, Ser. No. 414,960
Int. Cl.³ H02B 3/08; H01R 9/00
U.S. Cl. 339—126 R 8 Claims



1. An electrical connection assembly for use at a firewall bulkhead of a truck, for connecting electrical conduits coming from one side of the firewall with those coming from the other side, each electrical conduit terminating in a connection member, including in combination:

a main connection panel for insertion in an opening through said firewall and airtight, watertight attachment to said firewall, said panel having a unitary body of insulating material having a series of rows of through openings extending between a first outer face and a second flat face,

a series of metallic tubular first inserts secured airtight in said panel, one in and extending through each said through opening, each having an interiorly threaded portion leading in from said first face and a radially inset smooth-walled portion leading from said interiorly-threaded portion to said second face,

a series of first solid electrical binding posts, each having an exteriorly threaded portion, threaded into said interiorly threaded portion of each said first insert, and a head for clamping a first connection member to a said first insert at said first face,

a set of connector plugs, each having at least one row of through openings spaced to match a corresponding row on said panel,

keying means on said plugs and said panel for providing that each said plug can occupy only one possible position with respect to said panel in which the plug openings are accurately aligned with corresponding openings of said panel,

each said plug having a body of insulating material providing its said through openings, said body having a first flat face for abutting said second flat face of said panel and a second outer face,

a series of tubular, interiorly threaded second inserts, one secured airtight in each opening in each said plug body,

a second solid electrical binding post having a head, a threaded shank threaded into each said second insert, and an extension having a diametral split thereacross projecting out beyond said body and extending into and in electrical contact with said smooth-walled portion of a said first insert, for clamping a second connection member between the head of each said second post and said second insert,

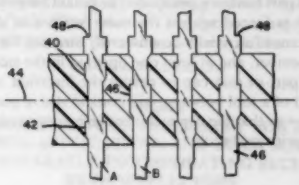
so that said first and second binding posts are electrically connected together.

4,464,007

PIN TERMINAL MOUNTING SYSTEM

Kenneth R. Parmer, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 25, 1982, Ser. No. 382,001
Int. Cl.³ H01R 4/24
U.S. Cl. 339—220 T 6 Claims



1. A pin header having a housing of insulative material having first and second oppositely directed faces, a cavity formed in one of said faces defining a thin base, a plurality of pin apertures in said base extending between said cavity and the other of said faces,

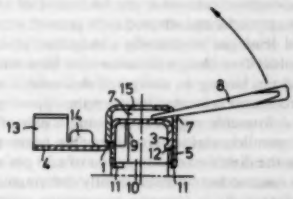
a plurality of pin terminals mounted in respective pin apertures of said header, each said pin terminal having a first mating portion lying in said cavity, a second mating portion extending beyond said other face, a board mounting portion in said second mating portion, and a retention portion lying within said aperture, said pin terminals being formed in a series of cooperating pairs of terminals, characterized by the first of each pair of pin terminals having a retention portion defining pairs of transverse enlargements equal distance from a centerline of the header base and the second of each pair of said pin terminals having a single transverse enlargement centered on said centerline of the header base so that material displaced by the pair of enlargements of the first of each pair of pin terminals flows above and below the single enlargement of the adjacent second of each pair of pin terminals while the material displaced by the single enlargement enters the area between the enlargements of the first pin terminal.

4,464,008

BATTERY POST CABLE CONNECTOR

Bengt U. I. Andersson, Björkvägen 8, S-460 20 Sjuntorp, and Sven B. Larsson, Myrgången 41, 461 62 Trollhättan, both of Sweden

Filed Apr. 12, 1982, Ser. No. 367,798
Claims priority, application Sweden, Apr. 15, 1981, 8102422
Int. Cl.³ H01R 11/28
U.S. Cl. 339—226 4 Claims



1. In a cable lug for connecting to a conically shaped battery post wherein a contact element made of a relatively soft electrically conducting material has a conical sleeve part, having an upper end, a lower edge and a side portion therebetween, which conforms to and can be forced over the battery post and held fixed to said battery post by a cap member, having an upper part, a lower lip and a side portion therebetween, of a relatively hard material pressed downward over said conical

sleeve part to force said sleeve part against the outer surface of the battery post, the improvement comprising said cap has a conical shape substantially conforming to said sleeve part and an internal diameter at least at the lower lip which is smaller than the outer diameter of at least the lower edge of said sleeve part prior to its positioning onto the battery post, so that when forced onto and pressed downward over the sleeve part after said sleeve part has been positioned onto said battery post, said sleeve part is forced against the outer surface of the battery post by means of an axially downwardly directed force only on said cap member, and at least one opening in the side adjacent the upper part of said cap to permit the insertion of a planar shaped end of a tool between said conical sleeve part and said cap member so that the cap member can be removed by prying upwardly with said tool.

4,464,009

SOLDERLESS CONNECTOR PIN FOR ELECTRICAL CIRCUITS

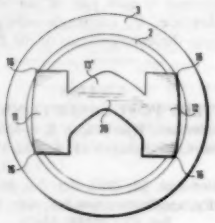
Hartmuth F. Thaler, Hohe Strasse 15, D-7110 Ohringen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 302,920, Sep. 16, 1981, abandoned. This application May 12, 1982, Ser. No. 377,485

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1981, 3107906; European Pat. Off., May 13, 1981, 81103663.1; Feb. 27, 1982, 82101521.1

Int. Cl.³ H01R *4/28*

U.S. Cl. 339—252 R **7 Claims**



1. An elongated connector pin fabricated of an electrically conductive material and adapted to be pressed into a metallized bore in at least one electrically conductive plate thereby to make a solder-free electrical connection between the pin and plate, said pin having an elongated deformable region of M-shaped cross section located between the opposing ends of said pin, said deformable region comprising a pair of spaced substantially parallel, elastically deformable beam members extending in the direction of elongation of said pin and interconnected to one another by an elastically deformable cross member of substantially V-shaped cross section, said deformable cross member being integral with each of said elastically deformable beam members and being disposed between said pair of beam members to provide said M-shaped deformable region, said pair of beams defining four outer corners which are adapted to mechanically penetrate and electrically contact the metallized side walls of the bore in the plate as a result of the elastic forces generated within said beam members and cross member when said connector pin is pressed into said bore, thereby to effect said connection.

4,464,010

ARRANGEMENT FOR DETACHABLY CONNECTING A WIRE TO A CIRCUIT BOARD CONDUCTOR

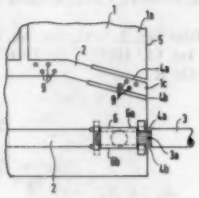
Kurt Grossman, Hallerndorf, and Jürgen Bliesner, Hemhofen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 25, 1983, Ser. No. 469,629

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1982, 3208065

Int. Cl.³ H01R *4/36*

U.S. Cl. 339—272 R **6 Claims**



1. An arrangement for detachably connecting a wire to a conductor lamination of a circuit board, the arrangement comprising:

a first conductor lamination portion arranged on the circuit board to extend inwardly thereon from a region in the vicinity of an edge of the circuit board and intermediate of first and second circuit board slots which are substantially parallel with each other and arranged to extend inwardly from an edge of the circuit board;

a clamping cage having first and second lateral portions for engaging in said first and second circuit board slots, respectively, a contact bridge portion mechanically coupled to said first and second lateral portions for holding the wire and arranged on a side of the circuit board where said first conductor lamination portion is arranged, and an engagement bridge portion mechanically coupled to said first and second lateral portions for securing said clamping cage;

first and second contact plates movably arranged on respective sides of the circuit board and within said clamping cage, each contact plate being provided with laterally extending tabs for bridging said first and second circuit board slots, the wire being interposed between said first contact plate and said contact bridge portion of said clamping cage; and

engagement means for engaging with said engagement bridge portion of said clamping cage and said second contact plate for securing said contact bridge portion of said clamping cage against the wire.

4,464,011

LIGHT BEAM SCANNING APPARATUS AND THE METHOD

Kensaku Takahashi, Hiratsuka; Yasuo Yatsugake, Odawara; Fukuo Iwaya, Tokyo; Makoto Ito, Hadano; Katsumi Takami, Tokyo, and Kyo Suda, Hachioji, all of Japan, assignors to Hitachi, Ltd. and Hitachi Electronics Engineering Co., Ltd., both of Tokyo, Japan

Filed Aug. 6, 1982, Ser. No. 406,044

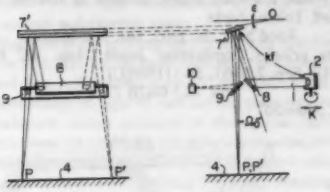
Claims priority, application Japan, Oct. 30, 1981, 56-173010

Int. Cl.³ G02B *27/17*

U.S. Cl. 350—6.1 **8 Claims**

1. A light beam scanning apparatus for projecting a light beam swept by a light scanner to a concave mirror and scanning by a light beam spot reflected and focused by said concave mirror a surface of an object arranged to oppose to said concave mirror at a position spaced from said concave mirror by a distance substantially equal to a focal distance f of said concave mirror;

characterized in that said concave mirror is a spherical mirror and an optical path length between said light scanner and said spherical mirror is set between about 0.78 f and about 0.84 f.



4,464,012
BROAD-BAND COMMUNICATION SYSTEM COMPRISING AN OPTICAL BROAD-BAND CABLE NETWORK

Giok D. Khoe, Eindhoven, Netherlands, and Friedrich Krahn, Bergisch Gladbach, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 12, 1982, Ser. No. 377,631

Claims priority, application Netherlands, May 26, 1981, 8102573

Int. Cl.³ G02B 5/16

U.S. Cl. 350—96.16 4 Claims

1. An optical broad-band cable network arranged between an exchange and a plurality of subscribers' stations in a broad-band communication system, said cable network comprising:

a plurality of optical fibers extending from the exchange to the subscribers' stations, said fibers being arranged in bundles, said bundles having decreasing numbers of fibers as the bundles extend from the exchange to the subscribers' stations; and

a plurality of branching points at each of which an incoming bundle of fibers is split into two or more separate outgoing bundles of fibers;

characterized in that:

each bundle of fibers comprises a plurality of individual optical fiber cables extending in the same direction; and

at two or more consecutive branching points, from the exchange to the subscribers' stations, an incoming bundle of optical fiber cables is divided without splices into two or more separate outgoing bundles of optical fiber cables, the separate outgoing bundles extending in different directions.

4,464,013
FILLED OPTICAL FIBER CABLES

Raffaele A. Sabia, Atlanta, Ga., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 29, 1982, Ser. No. 362,603

Int. Cl.³ G02B 5/14

U.S. Cl. 350—96.23 2 Claims

1. A cable comprising one or more optical fibers contained within a sheath leaving voids between the fibers and the sheath, and a filling material at least partially filling the voids, characterized in that

the filling material comprises a mixture of (1) 85 to 94 weight percent ASTM Type 103, 104A, or 104B, or mixtures thereof, paraffinic or napthenic oil having a minimum specific gravity of 0.855; a minimum SUS viscosity at 210 degrees F. of 40; and a maximum pour point ASTMD 97 of −5 degrees F.; and a maximum of 5 percent aromatic oils; (2) from 6 to 15 weight percent of a styrene-ethylene-butylene-styrene block copolymer having a styrene-rubber ratio of approximately 0.2 to 0.5; with the foregoing ingredients (1) and (2) comprising at least 99 weight percent of said filling material, and further comprising up to 1 weight percent thermal oxidative stabilizer.

4,464,014
RETROREFLECTORS, ESPECIALLY FOR BEAM SCANNING APPLICATIONS AND BEAM SCANNING APPARATUS INCORPORATING SUCH RETROREFLECTORS

Erwin Sick, Icking; Günter Fetzer, Gundelfingen, and Hermann Winterer, Freiburg, all of Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Fed. Rep. of Germany

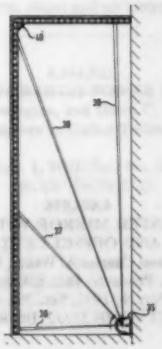
PCT No. PCT/EP81/00115, 371 Date Apr. 2, 1982, 102(e) Date Apr. 2, 1982, PCT Pub. No. WO82/00528, PCT Pub. Date Feb. 18, 1982

PCT Filed Aug. 6, 1981, Ser. No. 367,235

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1980, 3029794

Int. Cl.³ G02B 5/124, 5/128, 17/00

U.S. Cl. 350—105 5 Claims



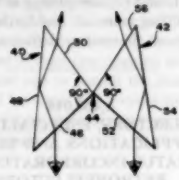
1. A retroreflector for use in beam scanning apparatus wherein a light beam is scanned periodically across said retroreflector at varying angles of incidence by a beam scanner, the retroreflector comprising a support structure and a housing for said support structure, said support structure lying generally in one plane and consisting of a plurality of regularly repeating surface elements inclined over a major portion of their surfaces relative to said plane, said surface elements adjoining one another at crests of the support structure and being covered by a layer of retroreflecting spheres the dimensions of which are small in comparison with said surface elements; wherein each said crest is a line of contact of minimal width between neighbouring surface elements of said support structure; and said housing including an elongate extruded rail and a plate member forming a transparent window located by said rail, said rail having a base section for supporting said support structure, said rail also having first and second sidewalls extending alongside said support structure, and respective inwardly facing lips provided on said sidewalls and spaced apart from said base section, wherein said plate member is retained beneath said lips in front of said support structure; and wherein resilient seals are provided between said plate member and said base section adjacent said sidewalls.

4,464,015

BINOCULAR STEREOSCOPIC VIEWERS

David R. Shafer, Fairfield, Conn., assignor to Center Art Galleries, Honolulu, Hi.

Filed Aug. 24, 1981, Ser. No. 295,569
Int. Cl.³ G02B 27/24, 7/18
U.S. Cl. 350—138 8 Claims



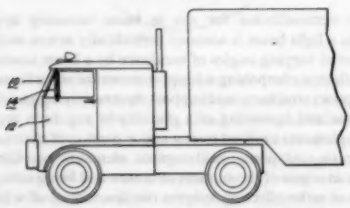
1. A binocular steroscopic viewer for deviating the line of sight of an observer such that the stereogram on the right is viewed by the left eye and the stereogram on the left is viewed by the right eye, comprising a pair of prisms mounted with their apices close together and pointed towards each other across the nose of the observer such that light enters through one face of each prism obliquely, is reflected obliquely off another face, passes through a third face obliquely and then is transmitted to the observer's eye.

4,464,016

POWER-ADJUSTED MIRROR WITH MOTOR ON HOUSING AND OFFSET CENTER WHEEL

Randall W. Weber, and Charles A. Weber, both of Elkhart, Ind., assignors to Bock Products, Inc., Elkhart, Ind.

Filed Nov. 8, 1982, Ser. No. 439,825
Int. Cl.³ G02B 5/132; B60R 1/06
U.S. Cl. 350—289 11 Claims



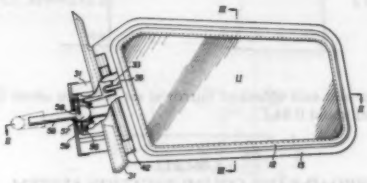
1. A power-adjusted mirror for mounting on a vehicle, comprising a housing with a mirror plate disposed on one side thereof, rod means about which said housing rotates extending vertically in said housing, a lug projecting laterally from said rod means, a wheel having an offset center of rotation and including a drive shaft on said offset center, said wheel disposed against said lug, motor means mounted on said housing for rotating said wheel, a resilient means for urging said wheel into contact with said lug and for urging said housing and mirror plate to various adjusted angular positions relative to said rod means.

4,464,017

REMOTELY CONTROLLED MIRROR APPARATUS FOR MOTOR VEHICLES

Yasuto Wada, Machida, Japan, assignor to Ichikoh Industries Limited, Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 363,222
Claims priority, application Japan, Aug. 31, 1981, 56-127802[U]; Sep. 7, 1981, 56-131988[U]
Int. Cl.³ G02B 7/18
U.S. Cl. 350—307 6 Claims



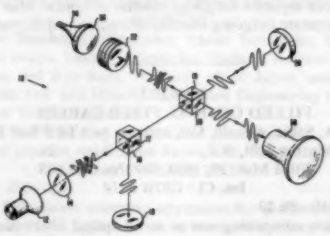
1. A remotely controlled mirror apparatus for motor vehicles comprising: a mirror, a mirror body for holding said mirror, a mirror housing supporting said mirror body so that said mirror body can be adjustably moved or inclined within said mirror housing, a base member for supporting said mirror housing on the body of a motor vehicle, spring means disposed between said mirror housing and said base member for resiliently holding said mirror housing on said base member, connecting means for rotatably connecting said mirror housing with said base member and a control mechanism for adjusting or inclining said mirror body with respect to said mirror housing in a remote control fashion, said control mechanism comprising a first link rotatably mounted on said mirror body, a second link rotatably mounted on said base member and rotatably connected with said first link, the rotation center of said second link with respect to said base member being remote from the rotation center of said first link with respect to said mirror body, and a stopper on said first link to restrict the rotation angle of said second link relative to said base member in such a manner that when said first link is rotatated through a predetermined rotation angle relative to said mirror body, said stopper contacts a portion of said mirror body.

4,464,018

LIQUID CRYSTAL LIGHT VALVE IMAGE PROJECTION SYSTEM WITH COLOR SELECTIVE PREPOLARIZATION AND BLUE MIRROR

Ralph J. Gagnon, Chico, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 28, 1981, Ser. No. 334,676
Int. Cl.³ G02F 1/13, 1/00; H04N 9/31
U.S. Cl. 350—331 R 1 Claim



1. An image projection system comprising:
means for providing a first beam of unpolarized white light energy;

means for splitting and prepolarizing said first beam into second and third beams, said third beam substantially consisting of a preselected color component of a first polarization state and substantially all color components of a second polarization state;

polarizing means for splitting said third beam into fourth and fifth beams, said fourth beam consisting essentially of light of said first polarization state and said fifth beam consisting essentially of light of said second polarization state;

color selective means mounted in the optical path of said fourth beam for changing the polarization state of a preselected color component of said fourth beam to said second polarization state and returning it to said polarizing means;

means mounted in the optical path of said fifth beam for selectively modulating the polarization state of said fifth beam from the second polarization state to the first polarization state and returning said modulated light to said polarizing means to be recombined with light from said color selective means into a sixth beam; and

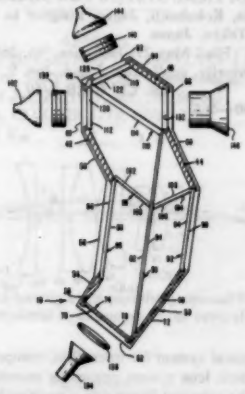
means for projecting light in said sixth beam.

4,464,019

TWO-COLOR LIQUID CRYSTAL LIGHT VALVE IMAGE PROJECTION SYSTEM WITH COLOR SELECTIVE PREPOLARIZERS IN SINGLE OPTICAL TANK

Ralph J. Gagnon, Chico, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 28, 1981, Ser. No. 334,678
Int. Cl.³ G02F 1/13
U.S. Cl. 350—331 R 8 Claims



1. A unitary optical arrangement comprising:

a first polarizing beam splitter which splits and prepolarizes light from a source into first and second beams having first and second polarization states, respectively;

a first dichroic separator which extracts light of a first color from said first beam;

a second dichroic separator which extracts light of a second color from said second beam;

a beam combiner which adds the outputs of said first and second separators to form a single beam; and

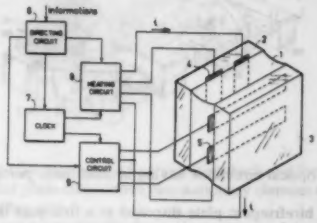
a second polarizing beam splitter which directs light of a first color and polarization to a first trim filter and light of a second color and polarization to a second trim filter.

4,464,020

SMECTIC LIQUID CRYSTAL DISPLAY DEVICE WITHOUT A NEMATIC PHASE

Serge Le Berre; Michel Hareng; Annie Beguin, and Lydie Thirant, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 20, 1982, Ser. No. 409,857
Claims priority, application France, Aug. 21, 1981, 81 16117
Int. Cl.³ G02F 1/137
U.S. Cl. 350—350 S 5 Claims



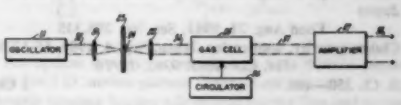
1. In a display device comprising a liquid crystal layer having a smectic phase, an isotropic phase, and a smectic-isotropic phase transition, said layer being subjected to a mixed thermal and electric writing effect through heating means and electric field addressing means, said smectic-isotropic phase transition consisting of a smectic phase and an isotropic phase.

4,464,021

ISOLATOR FOR HIGH POWER RADIATION

Clyde O. Brown, Newington, and David C. Smith, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 1, 1981, Ser. No. 249,757
Int. Cl.³ G02B 5/23
U.S. Cl. 350—354 5 Claims



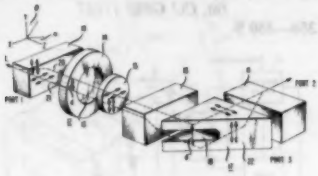
1. An optical device comprising:

frequency-insensitive spatial filter means, disposed along an axis, for passing radiation traveling along a path within a predetermined angle of said axis and frequency-insensitive thermal blooming deflection means including a fluid having an index of refraction responsive to the intensity of radiation passing therethrough and being positioned along said axis a predetermined distance from said spatial filter means, for deflecting radiation passing therethrough by a deflection angle the magnitude of which is dependent on the intensity of said deflected radiation, said thermal blooming deflection means being disposed with respect to said spatial filter means such that radiation of intensity less than a predetermined magnitude traveling along said axis is deflected by an angle less than said predetermined angle and radiation of intensity greater than said predetermined magnitude traveling along said axis is deflected by an angle greater than said predetermined angle, whereby radiation of intensity greater than said predetermined magnitude traveling through said thermal blooming deflection means toward said spatial filter means is deflected by an angle greater than said predetermined angle and is therefore blocked.

4,464,022
OPTICAL CIRCULATOR

William L. Emkey, Bethlehem, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 28, 1982, Ser. No. 425,693
Int. Cl.³ G02F 1/00
U.S. Cl. 350—377 8 Claims

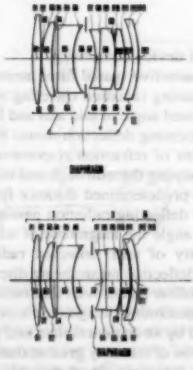


1. An optical circulator having at least three ports comprising:
- a first birefringent plate disposed at a first port in order to separate an incident light beam at that port into two beams having orthogonal directions of polarization;
- a second birefringent plate disposed at a second port in order to recombine the two beams;
- means disposed between the plates for nonreciprocal rotation of the directions of polarization of the beams;
- a third birefringent plate disposed between the rotation means and the second plate for further separating the two beams; and
- a reflecting element disposed between the third plate and second plate for deflecting the two beams toward the second port, the said element having a slot which permits passage therethrough of an incident beam from a third port.

4,464,023
LARGE RELATIVE APERTURE OBJECTIVE

Masatake Kato, Tokyo, and Shigeru Hashimoto, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1981, Ser. No. 298,335
Claims priority, application Japan, Sep. 4, 1980, 55-122859
Int. Cl.³ G02B 9/62, 15/18
U.S. Cl. 350—464 2 Claims



1. An objective lens of large relative aperture satisfying the following various conditions:

having three lens components, from front to rear,

the first lens component having a positive refractive power,

the second lens component having a positive refractive power,

the third lens component having a negative refractive power,

the first lens component and the third lens component being moved axially forward, while the second lens component is moved axially forward by a lesser amount than that of movement of the first lens component and the third lens component to effect focusing from infinity to shorter object distances,

letting f denote the focal length of the entire system, f_1, f_2 and f_3 the focal lengths of the first and second components and third lens component respectively, Δd the amount of variation of the air separation between the first lens component and the second lens component when focusing is effected from infinity to shorter object distances, and Δs the amount of forward movement of the first lens component and third lens component,

$$2.8f < f_1 < 3.1f$$

$$0.9f < fHd\ 2 < 1.1f$$

$$3.6f < |f_3| < 9.5f;\ f_3 < 0$$

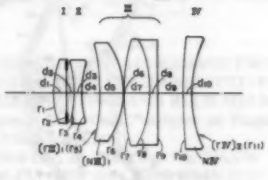
$$0.06 < \Delta d/\Delta s < 0.12$$

are satisfied.

4,464,024
OPTICAL SYSTEM FOR MICROFILM

Yu Yamada, Kokubunji, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1981, Ser. No. 265,952
Claims priority, application Japan, Jun. 9, 1980, 55-78054
Int. Cl.³ G02B 9/60
U.S. Cl. 350—465 6 Claims



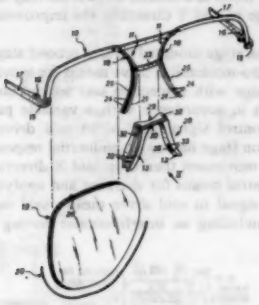
1. An optical system for microfilm, comprising:
- a projection lens system consisting essentially of, in order from the enlarged image side, a positive lens I, a biconcave lens II, a lens group III including two positive lenses having a concave first face directed toward the enlarged image side, and a negative lens IV having a concave last face, wherein an entrance pupil is positioned in the vicinity of the first face of said positive lens I and a stop is disposed inside of said projection optical system and at a position different from the position of the entrance pupil; and
- an image position correcting member being provided in the optical path of said projection lens system outside of said projection lens system and in the vicinity of an end of said projection lens directed toward the enlarged image side, and being adapted to correct rotational displacement of the image from a proper position thereof.

4,464,025

SPECTACLE FRAME

Bernard Lhospice, Blois, France, assignor to Essilor International Cie Generale d'Optique, Echat, France

Filed Jun. 30, 1982, Ser. No. 393,548
Claims priority, application France, Jul. 2, 1981, 81 13018
Int. Cl.³ G02C *1/04, 5/12*
U.S. Cl. 351—106 6 Claims



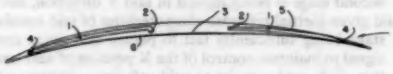
1. A spectacle frame comprising a support structure, two rims each adapted to receive a respective lens and each comprising a relatively rigid rail having at each end two transverse holes and a relatively flexible retaining member attached to said rail at each end thereof by passing through said holes, and nose pad means separate from said rails and said support structure, said nose pad means comprising two nose pads each adapted to bear on the nose of a wearer of the spectacle frame, each nose pad having two corresponding transverse holes so that said retaining member may be also be passed twice therethrough, said flexible retaining member securing said nose pad means to said rail.

4,464,026

PERIPHERAL FIBEROPTIC CONTACT LENS

John E. Comparetto, 108 Cropper St., Chincoteague, Va. 23336

Filed Jul. 24, 1979, Ser. No. 60,065
Int. Cl.³ G02B *5/14;* G02C *7/04*
U.S. Cl. 351—160 R 8 Claims



1. A contact lens having at its periphery optical fibers capable of bringing peripheral light images to the central portion of the contact lens.

4,464,027

BINOCULAR TRAINER

Clifford W. Cooper, P.O. Box 264, Santa Cruz, Calif. 95061

Continuation-in-part of Ser. No. 291,387, Dec. 7, 1982. This application Sep. 19, 1983, Ser. No. 460,678
Int. Cl.³ A61B *3/08*
U.S. Cl. 351—203 12 Claims

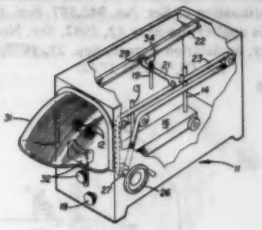
1. A device for testing, exercising and enhancing binocular vision comprising in combination,

(a) An enclosure having a pair of viewing apertures spaced for registry with human eyes through which an interior display space within the enclosure may be viewed,

(b) A first stationary element oriented and positioned in a vertical plane equidistant from each aperture within the display space,

(c) A second stationary element oriented in the same vertical plane as the first element positioned a linear distance from the first element within the display space,

(d) A focus element oriented in the same vertical plane as the stationary elements above the stationary elements within the display space,



(e) Means for moving the focus element back and forth in the vertical plane from above one stationary element to above the other, and

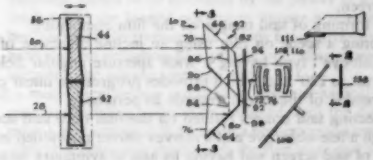
(f) Means for moving the focus element up and down in the vertical plane varying the vertical spacing between the respective stationary elements and the focus element.

4,464,028

MOTION PICTURE SYSTEM FOR SINGLE STRIP 3-D FILMING

Chris J. Condon, 16606 Oakview Dr., Encino, Calif. 91436

Filed Nov. 17, 1981, Ser. No. 322,261
Int. Cl.³ G03B *35/02*
U.S. Cl. 352—65 14 Claims



1. An optical system for attachment to a motion picture camera for 3-D motion picture filming comprising:

a system housing having a front and having first and second laterally spaced optical axes which lie substantially in a plane and extend from the front of said housing for directing at a subject, said housing having a rear, mounting means on the rear of said housing for mounting said housing on a camera;

first and second laterally spaced negative acromatic lenses on said axes, a lens housing, said first and second laterally spaced acromatic lenses being mounted on said lens housing, said lens housing being movably mounted on said system housing;

first and second rhomboid prisms, said first rhomboid prism having a face on said first laterally spaced axis and said second rhomboid prism having a face on said second laterally spaced axis, said first and second rhomboid prisms respectively having rearwardly directed faces positioned one above the other to define upper and lower image paths, said rhomboid prisms being notched adjacent each other to form adjacent notch faces on each prism, said notch faces lying substantially on the plane of said optical axes, said first and second laterally spaced negative acromatic lenses being the only refractive optical elements between the subject being filmed and said prisms; and

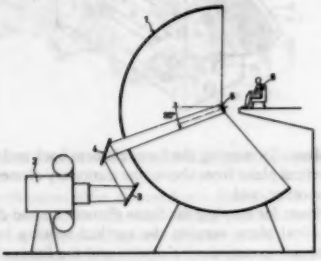
upper and lower rear lens systems on said upper and lower image paths for focusing upper and lower images onto the film plane of a camera.

4,464,029

WIDE ANGLE FILM SHOOTING AND PROJECTION OF TRUNCATED IMAGES

Philppe Jaulmes, Bureau du Polygone, Avenue des Etats du Languedoc, 34000 Montpellier, France

Continuation of Ser. No. 207,465, Nov. 17, 1980, abandoned, which is a continuation of Ser. No. 943,557, Sep. 18, 1980, abandoned. This application May 12, 1982, Ser. No. 377,396
Claims priority, application France, Sep. 21, 1977, 77 28510
Int. Cl.³ G03B *37/00*
U.S. Cl. 352—69 13 Claims



1. Process of wide angle film shooting and subsequent projection of images onto a concave screen essentially in the form of a spherical dome comprising

forming on the film, for projection, a series of closely adjacent truncated circular images having their truncations oriented longitudinally of the length of the film and all located near a common side of the film which corresponds to an upper portion of the image to be projected onto the screen,

said forming of said images on the film comprising

shooting a scene on film using an incline objective of the "fish-eye" type having a wide aperture angular field as great as 220° and which provides progressive linear compression of the image towards its periphery,

projecting said images formed on the film onto said screen through a tele-objective and a convex mirror positioned in the center of said screen and having its axis of symmetry inclined at the same angle as said objective used to shoot the scene, and adapated to the screen, said step of projecting said images comprising orienting said film so that the side of the film adjacent the truncations corresponds to the upper portion of the image projected on the screen and moving the so oriented film horizontally,

locating the tele-objective, during projection, at a distance from said convex mirror to enable the real image of each point of a film image to coincide with a corresponding point of the incurved virtual image formed on said screen by said convex mirror,

and compensating for aberrations caused by the said mirror at edges of said screen so as to produce on said screen a faithful image of the perspective of the scene.

4,464,030

DYNAMIC ACCURACY X-Y POSITIONING TABLE FOR USE IN A HIGH PRECISION LIGHT-SPOT WRITING SYSTEM

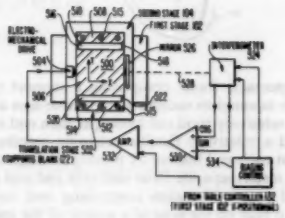
Michael T. Gale, Wettswil, and Karl H. Knop, Zurich, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Oct. 14, 1982, Ser. No. 434,317
Claims priority, application United Kingdom, Mar. 26, 1982, 8208930
Int. Cl.³ G03B *41/00*
U.S. Cl. 354—4 18 Claims

1. In combination with (1) an X-Y positioning table comprising a first stage movable with respect to a reference position in an X direction and a second stage mounted on said first stage and movable with respect to said first stage in a Y direction orthogonal to said X direction and (2) first control means coupled to said first and second stages of said X-Y positioning table for controlling the positioning of said second stage with respect to said reference position in both said X direction and said Y direction, said first control means being capable of maintaining control of the X position of said second stage with respect to said reference position with a first dynamic positioning accuracy while said second stage is moving with respect to said first stage in said Y direction; the improvement comprising:

a translation stage mounted on said second stage and including electro-mechanical drive means for moving said translation stage with respect to said second stage in said X direction in accordance with a variable parameter of a given control signal applied to said drive means, said translation stage having given inertial response characteristics to movement thereof in said X direction;

second control means for deriving and applying said given control signal to said drive means, said second control means including an interferometer having a mirror attached to said translation stage which mirror is illuminated with and reflects a beam of coherent wave energy along an optical path extending in said X direction, said parameter of said given control signal varying with changes in the length of said optical path in said X direction to effect a compensating movement in said X direction of said translation stage with respect to said second stage at a rate dependent on said given inertial response characteristics of said translation stage, said compensating movement of said translation stage in said X direction being opposite to any dynamic positioning error movement of said second stage in said X direction while said second stage is being moved in said Y direction; and



said given inertial response characteristics of said translation stage being sufficiently fast to permit said given control signal to maintain control of the X position of said translation stage with respect to said reference position with a second dynamic positioning accuracy which is higher than said first dynamic positioning accuracy, while said second stage is moving with respect to said first stage in said Y direction.

4,464,031

CONNECTION ARRANGEMENT FOR CAMERA SYSTEM COMPONENTS

Tomonori Iwashita, Tokyo, and Yukio Mashimo, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

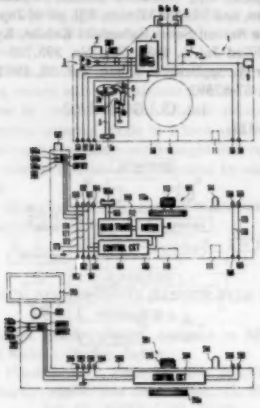
Filed Jun. 24, 1982, Ser. No. 391,965
Claims priority, application Japan, Jul. 1, 1981, 56-102502; Jul. 1, 1981, 56-102503
Int. Cl.³ G03B *1/18, 17/38*
U.S. Cl. 354—173.1 5 Claims

1. A camera to which a motor drive unit and a flash unit ar attachable, comprising:

(a) detecting means for producing a first signal when winding of the camera is not yet completed;

(b) a interconnection terminal for receiving a second signal

from said flash unit when charging of said flash unit is not yet completed and for delivering the first signal to a motor drive unit when a motor drive unit is mounted on the camera; and



(c) release prohibiting means for preventing a shutter release as long as at least one of said first and said second signal is applied thereto.

4,464,032

EXPOSURE TIME CONTROL DEVICE

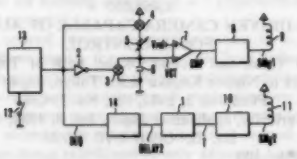
Masayoshi Kiuchi; Masanori Uchidoi, and Kazunobu Urushihara, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1982, Ser. No. 410,692

Claims priority, application Japan, Aug. 26, 1981, 56-134446; Dec. 29, 1981, 56-215340

Int. Cl.³ G03B *9/62, 9/64*

U.S. Cl. 354—234.1 **7 Claims**



1. An electrical exposure time control apparatus for a camera having a leading shutter curtain and a trailing shutter curtain which curtains overlap one another by a certain extent, comprising:

(a) first means (SMg1) for releasing said leading shutter curtain after a first time delay:

(b) first adjusting time producing means (5, 6, 7) fordetermining said first ime delay and controlling siad first means;

(c) an electromagnet (SMg2) having a certain response delay time for releasing said trailing shutter curtain after elapse an exposure time;

(d) electric timing means (1') for determining said exposure time and controlling said electromagnet;

(e) second adjusting time producing means (14) for adding a second time delay to said exposure time; and

(f) means (13) for producing a signal to render both of the first and second adjusting time producing means effective.

4,464,033

CAMERA AND RELEASE DEVICE THEREFORE

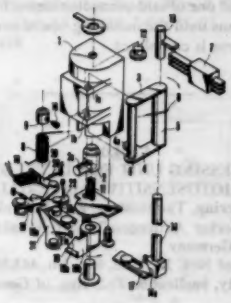
Masahisa Fujino; Akio Sunouchi, both of Tokyo; Tatsuo Konno, and Ryuji Suzuki, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1982, Ser. No. 361,839

Claims priority, application Japan, Apr. 2, 1981, 56-50361

Int. Cl.³ G03B *17/38*

U.S. Cl. 354—266 **6 Claims**



1. A release device for a camera comprising:

(a) a loading portion for holding a battery;

(b) detection means indicating a first state in which the battery is loaded into said loading portion and indicating a second state in which the battery is absent from the loading portion;

(c) an electromagnetic release mechanism having electromagnetic means to be activated by the power of a battery loaded into the loaded portion to initiate a release member, and said electromagnetic means being arranged to be activated by actuation of a release operating member for initiating the release member; and

(d) a mechanical release mechanism, said mechanical release mechanism being operatively coupled with the detection means, and arranged to be set in a non-operative condition when the detection means is in the first state and to set in an operable condition when the detection means is in the second state and being arranged for actuating the release member mechanically.

4,464,034

DEVICE FOR ELECTRICALLY CONNECTING LENS AND CAMERA

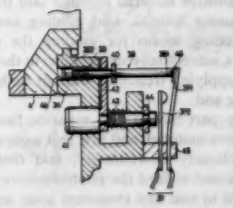
Naoki Tomino, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 5, 1982, Ser. No. 439,534

Claims priority, application Japan, Nov. 13, 1981, 56-169154[U]; Nov. 13, 1981, 56-181978

Int. Cl.³ G03B *17/12*

U.S. Cl. 354—286 **8 Claims**



1. A camera provided with plural connector means in a

mount for fixing a photographing lens, for electrically connecting an electric device provided in said photographing lens with an electric device provided in the camera body, comprising:

(a) means for electric power supply to said electric devices; and

(b) means for connecting said power supply means to one of said plural connector means, wherein said connecting means comprises switch means, and actuating means adapted for actuating said switch means to electrically separate said one of said connector means from said power supply means until the mounting operation of said photographing lens is completed.

4,464,035

PROCESSING UNIT FOR DEVELOPING PHOTOSENSITIVE MATERIALS

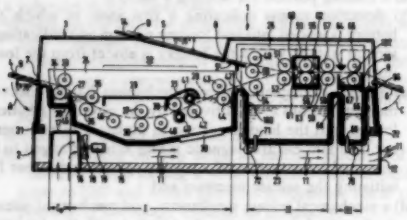
Eberhard Schoering, Taunusstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 23, 1982, Ser. No. 443,906

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1981, 3147002

Int. Cl.³ G03D *3/06, 3/08*

U.S. Cl. 354—299 **20 Claims**



1. A processing unit for photosensitive materials which have been exposed imagewise, comprising:

an integral tank bottom member having at least three recesses and tank inserts inserted in said recesses to form three separate tanks to define three separate treatment zones for the photosensitive materials, one treatment zone in each tank, said tanks being adapted to receive and hold a treatment fluid for each treatment zone;

means positioned in each of said treatment zones for applying a treatment fluid to both the top and bottom sides of the photosensitive material, wherein the applying means in the first treatment zone includes a cover which projects partially into the treatment fluid contained in the first tank;

means, attached to said inserts which are selectively removable from each of said tanks, for transporting and guiding the photosensitive material through said treatment zones in a continuous manner, said guiding and transporting means including means for guiding the photosensitive material in a substantially straight line in the region of said means for applying treatment fluid in each of said treatment zones; and

a housing top part having two separate feed slits for the photosensitive material, and first and second run-in tables inclined obliquely downwardly, said first run-in table being positioned to feed the photosensitive material via a first feed slit to said first treatment zone, and said second run-in table being positioned to transport the photosensitive material via the second feed slit to said second treatment zone.

4,464,036

METHOD AND APPARATUS FOR CONTROLLING ACTIVITY OF DEVELOPING SOLUTION AGAINST BLACKENING BY USING A TEST PIECE

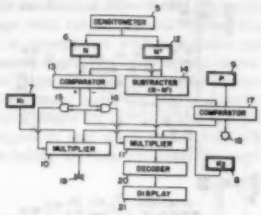
Hiroshi Taniguchi, Uji; Nobuhiro Takita; Norimasa Nomura, both of Kyoto, and Masaji Mizuta, Uji, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Jul. 6, 1982, Ser. No. 395,705

Claims priority, application Japan, Jul. 20, 1981, 56-113218; May 24, 1982, 57-87592

Int. Cl.³ G03D *3/02*

U.S. Cl. 354—324 **10 Claims**



1. A method for controlling the activity of a developing solution against blackening by using a test piece for use in an automatic developer, comprising the steps of:

(a) obtaining a difference between a standard density measured at a predetermined point of a first test piece developed in a standard developing solution, and a density of a second test piece of the same type as the first test piece measured at a point corresponding to said predetermined point of the first test piece, said second test piece being developed in a developing solution to be controlled;

(b) multiplying the thus obtained density difference by a predetermined factor to obtain a control value; and

(c) controlling the activity of the developing solution according to said control value by adding supplementary solution to the developing solution to be controlled when the standard density of the second test piece is smaller than the density of the first test piece.

4,464,037

MOTOR-DRIVEN CAMERA CAPABLE OF AUTOMATIC FOCUS CONTROL

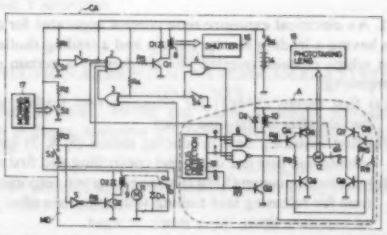
Nobuhiko Terui, and Nobuo Okabe, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Jul. 2, 1982, Ser. No. 394,665

Claims priority, application Japan, Jul. 8, 1981, 56-106609

Int. Cl.³ G03B *3/10, 17/38*

U.S. Cl. 354—400 **6 Claims**



1. In a camera having means for forming an image of an object on a predetermined plane; focus detection means for detecting the focusing condition of said image relative to said plane; focus adjusting means for adjusting said image forming

means depending on said detecting so as to obtain an in-focus condition of said image on said plane, said focus detection means producing an in-focus signal when said image is in focus on said plane; and means for exposure of film in response to a shutter releasing operation, the improvement comprising:

means for stopping operation of said focus adjusting means prior to said exposure and until the completion of said exposure;

control means having a first control mode in which said stopping means and said exposure means are brought into operation in response to the shutter releasing operation and a second control mode in which said stopping means and said exposure means are brought into operation at the shutter release operation in response to said in-focus signal; and

means for changing over the control mode between said first and second modes.

4,464,038

DISTANCE MEASURING DEVICE FOR USE IN A CAMERA

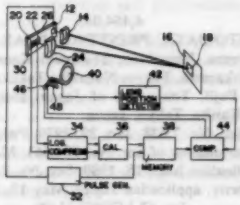
Yasuhiro Nanba, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 17, 1981, Ser. No. 331,817

Claims priority, application Japan, Dec. 22, 1980, 55-182658

Int. Cl.³ G03B *3/00, 13/18*

U.S. Cl. 354—403 **8 Claims**



1. A distance measuring device for use in a camera having an objective lens comprising:

a means for emitting light toward an object to be photographed for forming a light spot of a predetermined shape on said object;

a means, spaced from said emitting means by a predetermined base length, for receiving the light reflected from said object positioned within a normal distance range determined in accordance with said objective lens, said receiving means consisting of only two receiving elements which respectively constitute first and second receiving elements being positioned closely adjacent to each other;

wherein said first receiving element is located further away from said emitting means than said second receiving element such that a boundary between said first and second receiving elements extends in a direction which is substantially perpendicular to the direction of said base length, said first and second receiving elements having means for respectively producing first and second electric signals having values respectively corresponding to amounts of said reflected light received by said first and second receiving elements;

said measuring device further comprising a means for forming an image of said light spot on said first and second receiving elements such that both ends of said image along said direction of said base length are respectively positioned on said first and second receiving elements when said object is positioned within said normal distance range, said image bridging both of said receiving elements; and

a means for producing a distance signal which is representative of the distance from said camera to said object based on the ratio of the values of said first and second electric signals.

4,464,039

CHARGE COMPLETION DETECTING DEVICE FOR FLASH PHOTOGRAPHY SYSTEM

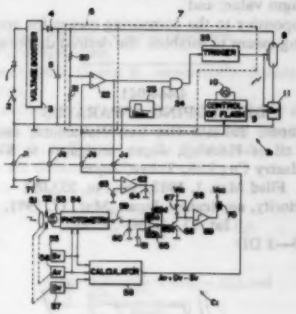
Tokuji Ishida, Daito, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 1, 1983, Ser. No. 471,055

Claims priority, application Japan, Mar. 3, 1982, 57-34312

Int. Cl.³ G03B *7/00, 15/03*

U.S. Cl. 354—418 **10 Claims**



1. A flash photography system, comprising:

a flash tube for illuminating an object to be photographed;

a flash amount instructing means for generating an instruction signal representative of an amount of flash light required for flash photography;

a main capacitor for energizing the flash tube;

a charged signal generating means for generating a charge related signal corresponding to a charged voltage of said main capacitor; and

a comparator means for comparing said instruction signal and said charge signal and generating a charge completion signal when the two signals reach a predetermined relationship with respect to one another.

4,464,040

CAMERA WITH DIAPHRAGM ADJUSTMENT CONTROL

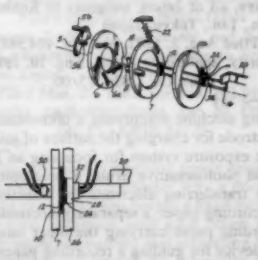
Zenichi Okura, Ichikawa, and Shinsuke Kohmoto, Tokyo, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 10, 1982, Ser. No. 448,714

Claims priority, application Japan, Dec. 17, 1981, 56-188507[U]

Int. Cl.³ G03B *7/08*

U.S. Cl. 354—455 **18 Claims**



1. A photographic camera comprising:

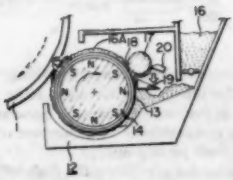
a camera body;
an interchangeable lens assembly engagable with the camera body;
a diaphragm having an adjustable diaphragm value in the lens assembly;
means for adjusting the diaphragm value upon shutter release;
means in the lens assembly for sensing the diaphragm value during adjustment;
means for transmitting to the camera body a first signal representative of the sensed diaphragm value;
means in the camera body responsive to the first signal for comparing the sensed diaphragm value with a desired diaphragm value; and
means responsive to the comparing means for arresting the adjusting means to establish the desired diaphragm value.

4,464,041

DEVELOPING APPARATUS

Satoshi Haneda; Takashi Ito; Ken Nakamura, and Makoto Tomono, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1982, Ser. No. 353,091
Claims priority, application Japan, Mar. 17, 1981, 56-38262
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 DD **10 Claims**



1. In a developing apparatus for producing an electrostatic latent image on a charge retaining member, in which means producing a shifting magnetic field are provided for transporting a magnetic toner from a toner source to a developing area on said retaining member, the improvement comprising means regulating the amount of toner transported comprising a magnetizable member positioned adjacent said transporting means between said toner source and said developing area, said magnetizable member having an external form whose outer surface is spaced sufficiently close to said transporting means and of such shape that the shifting magnetic field of said transporting means induces a shifting magnetic field on the surface of said magnetizable member to attract excess toner from said transporting means.

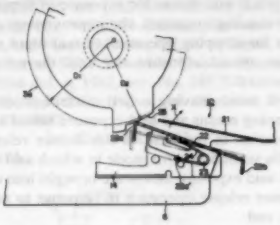
4,464,042

DEVICE FOR GUIDING A RECORDING PAPER

Kazuo Omori; Hiroshi Tsuchiya; Yoshio Yamazaki, and Shigeru Inowa, Tokyo, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1982, Ser. No. 404,548
Claims priority, application Japan, Aug. 10, 1981, 56-124106
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 SH **7 Claims**

1. A copying machine comprising a photosensitive drum; a charging electrode for charging the surface of said photosensitive drum; an exposure system for focussing an image on the surface of said photosensitive drum; a developing device for said image; a transferring electrode for transferring a toner image to a recording paper; a separating electrode for separating said recording paper carrying the toner image from said drum; and a device for guiding a recording paper which comprises a guide member pivoted to a fixed position of said device to guide the recording paper to a transfer position and urged to rotate in one direction, and a reference member on a fixed portion of said device to determine the position of an end



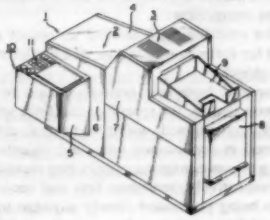
portion of said guide member in the direction of feeding the paper.

4,464,043

AUTOMATIC PRINTING APPARATUS

Noboru Koumura, Narashino; Toshiyuki Komatsu, Kawasaki; Katsumi Nakagawa, Tokyo; Nobuhiro Takekawa, Tokyo, and Motoharu Fujii, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 7,628, Jan. 29, 1979, Pat. No. 4,255,041, which is a continuation of Ser. No. 794,661, May 6, 1977. This application Mar. 18, 1980, Ser. No. 131,497
Claims priority, application Japan, May 17, 1976, 51-56263
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 C **26 Claims**



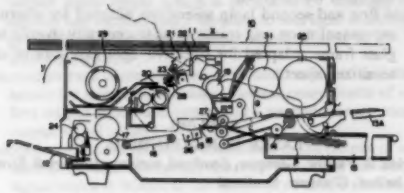
1. An automatic printing apparatus comprising a recording medium, printing means including a plurality of elements for forming an image on the recording medium, means for instructing the starting and stopping of operation of the apparatus, means for detecting an operational status of the apparatus, a plurality of visual indicating elements for indicating functions of said elements, digital control means coupled to said detecting means and to said instructing means for controlling the sequence of operations of said plurality of image forming elements and the display operation of said visual indicating elements, and digital control means including a memory having a stored program for controlling energization of said image forming elements in accordance with said starting and stopping instructions and the detected operational status of the apparatus, wherein said digital control means is provided with first and second independent outputs coupled respectively to said image forming elements and said visual indicating means.

4,464,044

IMAGE FORMING APPARATUS

Kouzou Matsuyama, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1982, Ser. No. 379,041
Claims priority, application Japan, May 18, 1981, 56-74729
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **7 Claims**



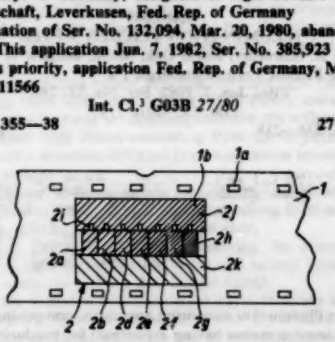
1. An image forming apparatus comprising:
document holding means for holding a document;
a rotatable photoconductive drum;
charging means for charging said photoconductive drum;
exposure means for exposing said photoconductive drum to form an electrostatic latent image corresponding to the pattern of said document placed on said photoconductive drum;
a developer for converting said electrostatic latent image into a toner image;
means for transferring the toner image onto a copy paper;
a plurality of driving elements for driving said photoconductive drum, charging means, exposure means, developer and transferring means;
microprocessor means having memory means for storing programs for executing a variety of diagnosis modes including combination check modes for checking the operation of at least two of said driving elements, and an image forming process mode;
means for designating the mode to be executed; and
said microprocessor means causing at least two driving elements to operate in accordance with the combination check mode designated by said designating means.

4,464,045

METHOD OF AND AN ARRANGEMENT FOR CALIBRATING A COLOR COPYING APPARATUS

Günter Findeis, Sauerlach; Berthold Fergg, Taufkirchen; Wolfgang Zahn, Munich, and Gerhard Kuhn, Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 132,094, Mar. 20, 1980, abandoned. This application Jun. 7, 1982, Ser. No. 385,923
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1979, 2911566
Int. Cl.³ G03B *27/80*
U.S. Cl. 355—38 **27 Claims**



1. A method of calibrating a color copying apparatus, comprising the steps of copying a calibrating original which includes a stepped gray zone having steps of predetermined density and color composition onto a copying material; processing the copying material to obtain a developed image of the calibrating original; measuring the densities of the calibrating original and the developed image thereof in each of the three primary colors; and adjusting the exposure using the equations

$$\Delta(\log It)_B=\Delta_B+\alpha_{GB}\Delta_G+\alpha_{RB}\Delta_R$$

$$\Delta(\log It)_G=\alpha_{BG}\Delta\text{hd }B+\Delta_G+\alpha_{RG}\Delta_R$$

$$\Delta(\log It)_R=\alpha_{BR}\Delta_B+\alpha_{GR}\Delta_G+\Delta_R$$

where
I is the light intensity during exposure,
t is the exposure time,
the subscripts B, G and R, respectively, denote blue, green and red,
the α coefficients have absolute values smaller than one and depend upon the characteristics of the copying material, and the Δ coefficients on the right-hand sides of the equations are defined by the expressions

$$\Delta_B=\frac{b_m-b_u}{B_m-B_u}\cdot(B_m-B_z),$$

$$\Delta_G=\frac{g_m-g_v}{G_m-G_v}\cdot(G_m-G_z),\text{ and}$$

$$\Delta_R=\frac{r_m-r_w}{R_m-R_w}\cdot(R_m-R_z)$$

b_m and b_u being the blue densities of respective steps on the calibrating original,
g_m and g_v being the green densities of respective steps on the calibrating original,
r_m and r_w being the red densities of respective steps on the calibrating original,
B_m and B_u being the blue densities of the developed images of respective steps on the copying material,
G_m and G_v being the green densities of the developed images of respective steps on the copying material,
R_m and R_w being the red densities of the developed images of respective steps on the copying material,
B_z being the desired blue density of a predetermined field of the developed image of the stepped zone on the copying material,
G_z being the desired green density of a predetermined field of the developed image of the stepped zone on the copying material, and
R_z being the desired red density of a predetermined field of the developed image of the stepped zone on the copying material.

4,464,046

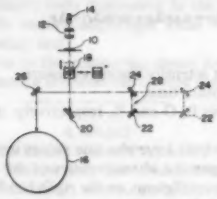
COPYING MACHINE CAPABLE OF CONTINUOUSLY VARYING MAGNIFICATION

Yukio Kanazawa; Toshikatsu Takahashi, and Yoshiyuki Ishitate, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 362,942
Claims priority, application Japan, Apr. 30, 1981, 56-65987
Int. Cl.³ G03B *27/70*
U.S. Cl. 355—57 **2 Claims**

1. A copying machine comprising image projecting means including a light source, a condenser lens, a microfilm station and at least one projecting lens having a fixed focus disposed in operative co-axial alignment with each other; magnification varying drive means for moving said projecting lens along the optical axis thereof comprising an externally threaded lens barrel supporting said projecting lens therein, internally

threaded collar means disposed in threaded engagement with said lens barrel, drive means for rotating said collar means and stop means engaging said lens barrel to prevent rotation of said lens barrel so that upon rotation of said collar means said projecting lens will be moved axially along the optical axis thereof; a parallel reflection optical system for reflecting an incident light beam from said image projecting means in parallel opposite directions along a path disposed perpendicular to the axis of said image projecting means and having a predetermined length comprising moveable support means, first and second reflecting mirrors carried by said support means at



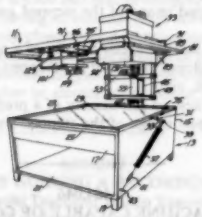
right angles to each other, a third reflecting mirror disposed in alignment with the optical axis of said projecting lens for directing an incident beam of light from said projecting lens ninety degrees to said first reflecting mirror, a photosensitive drum having an axis disposed orthogonal to the axis of said path and a fourth reflection mirror for directing the light beam reflected by said second reflecting mirror ninety degrees onto said photosensitive drum; and optical path length adjusting means comprising drive means for moving said support means having said first and second mirrors mounted thereon in opposite directions toward and away from said third and fourth reflecting mirrors.

4,464,047

OVERHEAD MULTIPLE LAMP MOUNT CONSOLE FOR A VACUUM PRINTER

Robert J. Maher, Auburn Heights, and Ronald Tooson, Inkster, both of Mich., assignors to Douthitt Corporation, Detroit, Mich.

Filed Mar. 16, 1983, Ser. No. 475,760
Int. Cl.³ G03B *27/20*
U.S. Cl. 355—93 **21 Claims**



1. In a vacuum printer for the graphic arts having a housing, a blanket frame and a glass frame overlying the housing and adapted to receive therebetween a negative and an underlying light sensitive sheet;

an upright mounted upon, secured to and projecting above said housing upon one side thereof;

an overhead multiple lamp mount console overlying said glass frame and adjustably spaced therefrom comprising;

an upright carriage assembly slidably and guidably mounted upon said upright;

an open top frame parallel to overlying and spaced from said glass frame and upon one side secured to said carriage assembly;

a pair of opposed parallel spaced lamp tracks mounted upon and spanning said top frame and extending lengthwise of said glass frame;

a first lamp assembly of a predetermined first wattage spanning and movably mounted upon said tracks adjacent one end thereof;

a second lamp assembly of a predetermined second wattage spanning and movably mounted upon said tracks adjacent the other end thereof;

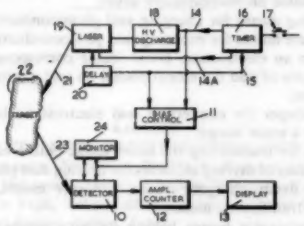
said first and second lamp assemblies adapted for alternate movement upon said tracks so as to centrally overlie said glass frame, adapted for selective light exposure of said sensitized sheet.

4,464,048

LASER RANGEFINDERS

Adrian R. Farlow, Glasgow, Scotland, assignor to Barr & Stroud Limited, Glasgow, Scotland

Filed Mar. 4, 1982, Ser. No. 354,910
Claims priority, application United Kingdom, Mar. 25, 1981, 8109051
Int. Cl.³ G01C *3/08*; H01J *40/14*
U.S. Cl. 356—5 **4 Claims**



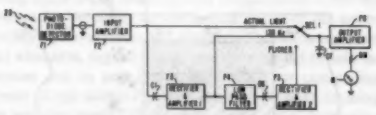
1. A laser rangefinder having a transmitter and a receiver, wherein the receiver comprises an avalanche photodiode the bias voltage of which is provided by circuitry controlled in time from the laser transmitter to establish substantially zero bias voltage when the transmitter is fired and to increase the bias voltage during a predetermined time interval therafter to establish a final bias voltage substantially equal to a fixed percentage below the breakdown voltage of the photodiode prevailing immediately prior to firing of the laser transmitter, said circuitry incorporating means to determine said breakdown voltage at the operating temperature prevailing immediately prior to firing of the laser transmitter.

4,464,049

ILLUMINATION FLICKER METER

Eugene R. Schroeder, Royal Oak, Mich., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 7, 1982, Ser. No. 337,789
Int. Cl.³ G01J *1/42*
U.S. Cl. 356—218 **10 Claims**



1. An illumination measuring apparatus, comprising:

light sensing means having an output, for producing a first output signal related to the output of a measured light source;

first storage means connected to receive said first output signal for removing the average value of said first output

signal thereby producing a second output signal at an output thereof;

first unidirectional means having an input connected to receive said second output signal for removing the lower envelope of said first output signal thereby providing a third output signal at an output thereof;

filter means having an input connected to receive said third output signal for removing that component of said first output signal ripple which is produced by standard frequency line current being supplied to said light source and producing a filter means output signal related to the remaining signal;

second storage means connected to said output of said filter means for removing the direct current components of said first output signal and producing a second storage means output signal related thereto; and

second unidirectional means connected to the output of said second storage means for thereby providing an output signal which is related to the flicker produced by said light source.

4,464,050

APPARATUS FOR DETECTING OPTICALLY DEFECTS

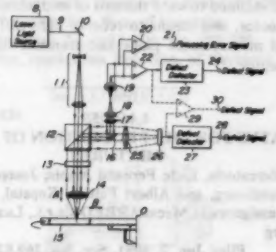
Kiichi Kato, Hachioji; Masaharu Sakamoto, Tokyo; Shoji Yoshikawa, Hachioji; Kunio Yamamiya, Tokyo; Hiroshi Kodama, and Ken Ohsima, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Feb. 2, 1982, Ser. No. 345,153

Claims priority, application Japan, Feb. 7, 1981, 56-16294

Int. Cl.³ G01N *21/88*

U.S. Cl. 356—237 **15 Claims**



1. An apparatus for detecting optically defects in objects comprising

means for emitting a laser light flux having a small diameter;

an objective lens having a diameter larger than said diameter of laser light flux for focussing it onto an object to be checked and for collecting a light flux directly reflected by the object and a light flux scattered by a defect in the object;

first beam splitting means directing the laser light flux emanating from said laser light emitting means toward the objective lens and for directing said directly reflected and scattered light fluxes emanating from the objective lens toward a direction different from a direction to said emitting means;

second beam splitting means for splitting the directly reflected and scattered light fluxes emanating from said first beam splitting means from one another;

first light detecting means for receiving the directly reflected light flux emanating from said second beam splitting means to derive a first output signal;

means for receiving said first output signal to derive a focussing error signal in accordance with a variation in the directly reflected light flux due to a fluctuation in a distance between the objective lens and the object;

means for driving the objective lens into an in-focussed position in response to said focussing error signal;

second light detecting means for receiving the scattered light flux emanating from said second beam splitting means to derive a second output signal; and

means for receiving at least one of said first and second output signals to produce a defect signal representing an existence of the defects in the object.

4,464,051

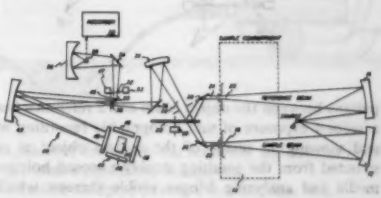
SPECTROPHOTOMETER

Paul C. Talmadge, Ansonia, and Joseph A. Vergato, W. Redding, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 2, 1982, Ser. No. 354,254

Int. Cl.³ G01J *3/08, 3/42*

U.S. Cl. 356—323 **5 Claims**



1. A spectrophotometer comprising, in combination:

a source of radiation;

an optical system for forming a beam of radiation from said source and directing it along a sample path and along a reference path, which paths come together at a location to form a combined path that impinges on a detector;

chopper means mounted at said location for successively directing one or the other of said beams along said combined path or providing a blank chopper area for blocking radiation from said combined path, said chopper means including a chopper motor controller and a chopper motor

monochromator means having grating means mounted in said combined path, means for adjusting the angular position of said grating means for passing selected successive wavelengths of radiant energy through said optical system;

control means for controlling the movement of said means for moving the grating so that movement only occurs when said blank chopper area is blocking said combined path, said control means including a microprocessor and memory, and

a master timer for inputting timing signals to said chopper motor controller and to said microprocessor, said chopper motor controller being arranged to input into said microprocessor a plurality of pulses per cycle, one corresponding to each position of the chopper, said chopper motor being arranged to input into said microprocessor one sync pulse per cycle.

4,464,052

DIFFERENTIAL HOLOGRAPHIC INTERFEROMETRY

Don B. Neumann, 290 Wave St., Laguna Beach, Calif. 92651

Filed May 4, 1981, Ser. No. 260,505

Int. Cl.³ G01B *9/021*

U.S. Cl. 356—347 **10 Claims**

1. The method of analyzing the difference in surface contours of two objects having similar surface contours, comprising:

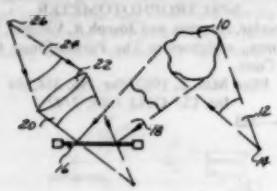
forming a first hologram of a first of the objects in a first state;

forming a second hologram of the first of the objects in a second state;

illuminating the second object, while it is in said first state,

with light wavefronts reconstructed from said first hologram and recording the interference pattern between the resulting object beam and a reference beam in a first exposure of a holographic recording media;

illuminating the second object, while it is in said second state, with light wavefronts reconstructed from said second hologram and recording the resulting interference



pattern between the object beam and a reference beam in a second exposure of said holographic recording media; and viewing an image of the second object as reconstructed from the resulting doubly exposed holographic media and analyzing fringes visible thereon which are representative of the differences in surface contours of the first and second object.

4,464,053

METHOD FOR CORRECTING A MEASURING SIGNAL

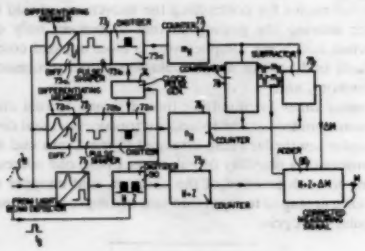
Viktor Bodlaj, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 7, 1981, Ser. No. 291,017

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1980, 3036886

Int. Cl.³ G01B *11/00*; G01D *3/02*

U.S. Cl. 356—376 **10 Claims**



3. A method for correcting a measuring signal generated by an apparatus which measures in contact-free fashion by scanning a surface to be measured with a light beam, and detecting light from the surface with an opto-electric detector, comprising the steps of:

forming the measuring signal in dependence upon electrical signals emitted by the detector;

correcting the measuring signal in dependence upon a symmetrical shape distortion in at least one of the electrical signals from the detector; and

determining the distortion of the electrical signal through differentiation and comparison of specific portions of the wave form of the differentiated signal.

4,464,054

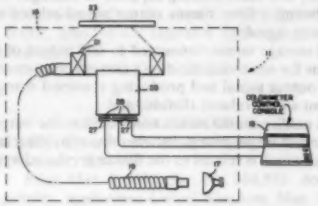
COLORIMETER INSTRUMENT WITH FIBER OPTIC RING ILLUMINATOR

Philip Karras, Silver Spring, and Jack A. Ladson, Olney, both of Md., assignors to Pacific Scientific Company, Anaheim, Calif.

Filed May 27, 1982, Ser. No. 382,618

Int. Cl.³ G01J *3/50*

U.S. Cl. 356—406 **11 Claims**



1. A color sensing system comprising means defining a measurement plane adapted to receive at said measurement plane a test surface for purposes of making a color measurement, a source of light, a fiber optic cable having one end positioned to receive a beam of light directly from said source and the other end positioned to transimit light to said measurement plane, the ends of the optic fibers in said other end of said fiber optic cable being formed into and uniformly distributed in an annulus with the ends of said fibers pointed toward said test surface plane and inclined toward the axis of said annulus, at least one photodetector, and means to receive light diffusely reflected from said measurement plane and transmit the light to said photodetector.

4,464,055

APPARATUS FOR THE PRODUCTION OF COLLOIDAL MIXTURES

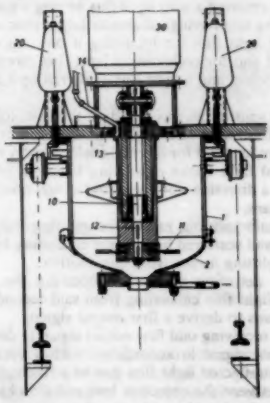
Robert Mercatoris, Eich; Fernand Artois; Joseph Colling, both of Luxembourg, and Albert Feitler, Kopstal, all of Luxembourg, assignors to MecanARBED s.a.r.l., Luxembourg, Luxembourg

Filed Jun. 2, 1981, Ser. No. 269,825

Claims priority, application Luxembourg, Jun. 4, 1980, 82500; Dec. 8, 1980, 82988

Int. Cl.³ B28C *5/00, 5/26, 7/00*

U.S. Cl. 366—26 **11 Claims**



1. Apparatus for the production of colloidal mixtures, espe-

cially water-cement mixtures comprising a mixing container having a bottom; an inlet for the solid material to be fed into said container; a blade stirrer arranged adjacent to the bottom of the container; drive means arranged above the mixing container; shaft means having a portion in said container and connecting said drive means with said blade stirrer; a protective casing surrounding the portion of the shaft means in said container and having a lower end tightly engaging said shaft means and connected to the latter for rotation therewith, said casing projecting upwardly from said lower end radially spaced from said shaft means and having an upper open end; and water inlet means arranged for discharging a stream of water in the region of said upper open end of said casing into said container so as not only to supply water for producing a water-cement mixture, but also to prevent accumulation of residual material on said shaft means.

4,464,056

MIXING HEAD FOR REACTIVE MATERIALS

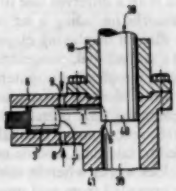
Horst Schmitz, Munich, and Wolfgang Krompass, Inning, both of Fed. Rep. of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed May 24, 1982, Ser. No. 381,740

Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120482

Int. Cl.³ B01F 5/04

U.S. Cl. 366—134 9 Claims



1. A mixing head for two reactive components comprising: means forming:

an elongated mixing chamber provided with ports for introducing said components into said mixing chamber, and an outlet opening at one end of said mixing chamber;

a first plunger shiftable in said mixing chamber between a retracted position in which a mixture of said components is formed therein, and a second position wherein said first plunger is advanced to said opening to drive said mixture from said chamber;

means forming an elongated quieting channel communicating with said mixing chamber at said opening and having a discharge end;

a second plunger shiftable in said channel between a retracted position wherein said mixture can be discharged through said channel, and an advanced position wherein said second plunger drives said mixture from said channel; and

means for positioning at least one end of said second plunger across said opening in said retracted position of said second plunger to partially obstruct flow from said mixing chamber into said channel.

4,464,057

RECOVERY AND TREATMENT OF VISCOUS PETROLEUM EMULSIONS

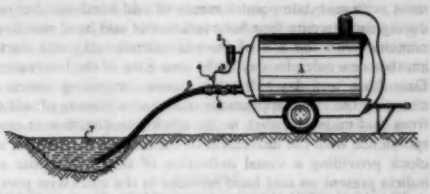
Marc M. Durrieu, Le Havre, and Jean-Pierre Thery, Le Chesnay, both of France, assignors to Compagnie Francaise des Petroles, Paris, France

Continuation of Ser. No. 195,713, Oct. 9, 1980, abandoned. This application Dec. 13, 1982, Ser. No. 449,284

Claims priority, application France, Oct. 12, 1979, 79 25515

Int. Cl.³ B01F 5/06, 13/06, 15/02

U.S. Cl. 366—139 10 Claims



1. Apparatus for use in the recovery and treatment of viscous petroleum emulsions, comprising:

an emulsion feedpipe having a downstream end;

a mixer arranged on said feedpipe;

a leaktight chamber larger than said feedpipe and said mixer for permitting the separation, by settling, of components of an emulsion sucked into said chamber, said leaktight chamber being connected to said downstream end of said emulsion feedpipe;

means for producing a vacuum in said chamber to create therein a reduced pressure for sucking said emulsion through said feedpipe;

a tank for containing a chemical demulsifier; and

an injection feedpipe connecting said tank to an upstream end of said mixer such that, in use, emulsion and demulsifier are simultaneously sucked in, mixed, and introduced into said chamber.

4,464,058

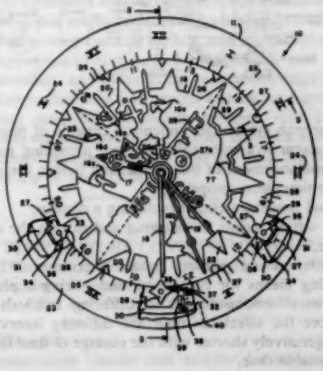
WORLD TIME AND DAY INDICATOR CLOCK

Barton L. Weller, Box 68, Monroe, Conn. 06468

Filed Sep. 29, 1982, Ser. No. 427,602

Int. Cl.³ G04B 19/26

U.S. Cl. 368—21 17 Claims



1. A date clock comprising a casing containing a chronometer mechanism comprising at least one central axial shaft which is adapted to make one complete clockwise revolution every twenty-four hours, a dial on said casing having a central opening, a geographic hand member attached to said shaft through

said central opening of the dial and extending parallel to and closely spaced from the surface of said dial for 360° rotation with said shaft around said dial, said hand member comprising indicia of geographic areas of the Earth in various geographically-accurate radial directions relative to the axis of rotation of said hand member which coincides with the axis of rotation of the Earth, and at least one date pointer means adjacent an extremity of said hand member and located in a geographically-accurate position relative to said geographic areas to indicate the time zone of the International Date Line, said dial comprising a fixed midnight mark which is located for alignment with said date pointer means of said hand member once during each twenty-four hour rotation of said hand member to coincide with the end of the old calendar day and start of another new calendar day in the time zone of the International Date Line, and day-indicating means comprising means for changing the visual appearance of at least a portion of said dial from said midnight mark in the clockwise direction in correspondence with the movement of the date pointer means, said clock providing a visual indication of said geographic area indicia present on said hand member in the clockwise portion thereof located between the fixed midnight mark on the dial and the date pointer means, the corresponding portion of said dial being visually distinguished from the remainder of said dial by the changed portion of said day-indicating means, and geographic area indicia present on said hand member in the counter clockwise portion thereof located between the midnight mark on the dial and the fixed pointer means on said hand member, the corresponding portion of said dial being visually distinguished from the remainder of said dial by the unchanged portion of said day-indicating means.

4,464,059

SPEECH SYNTHESIZER TIMEPIECE WITH ADVANCE ANNOUNCEMENT

Kunio Yoshida, and Yutaka Ikemoto, both of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 29, 1981, Ser. No. 316,402

Claims priority, application Japan, Oct. 29, 1980, 55-152932; Oct. 29, 1980, 55-152933

Int. Cl.³ G04C *21/14*

U.S. Cl. 368—63 **5 Claims**

1. A speech synthesizer timepiece capable of providing an audible alarm at a selectable time and providing audible advance announcement of time remaining before the selectable time, the timepiece comprising

a digital timepiece circuit including a display,

alarm setting means for entering and storing the selectable time,

computation and memory means responsive to the alarm setting means for computing and storing a plurality of advance announcements at differing intervals of time before the selectable time, the differing intervals being progressively shorter with the passage of time toward the selectable time,

detection means responsive to the alarm setting means and the computation and memory means for detecting when each successive one of the stored advance announcement times is reached, and

speech generation means responsive to the detection means for generating a speech synthesized audible output announcing the remaining time before the selectable time at each of the progressively shorter intervals.

4,464,060

ELECTRONIC CHESS CLOCK

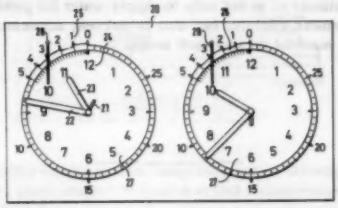
Manfred Schneider, Miesenbacher Strasse 16, 6792 Ramstein-Miesenbach 1, Fed. Rep. of Germany

Filed Apr. 4, 1983, Ser. No. 481,852

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1982, 8209994[U]

Int. Cl.³ G04F *3/00*

U.S. Cl. 368—96 **12 Claims**



1. An electronic chess clock, comprising a generally rectangular casing, an elongate switching lever mounted on said casing for pivotal movement about the center of said switching lever, two microswitches each mounted within said casing in operative relation to a corresponding end of said switching lever so that a selected one of said two microswitches is actuated when the corresponding end of said switching lever is pivoted toward the selected microswitch, two electromechanical clockworks contained in said casing for measuring and displaying time periods in response to actuation of said microswitches by said switching lever wherein each of said clockworks is associated with a different one of said microswitches, each of said clockworks including a set of hands and a clock face having a first dial for displaying elapsed hours in a clockwise direction and a second dial, concentric with said first dial, for displaying elapsed minutes in a counterclockwise direction, quartz-controlled time module means associated with said clockworks for generating time pulses at a first frequency and at least a second frequency, and a manually actuable change-over switch coupled to said time module means for controlling operation of said clockworks wherein said time pulses at said first frequency are provided from said time module means to a selected one of said clockworks when said change-over switch is in a first position, and said time pulses at said second frequency are provided from said time module means to the selected one of said clockworks when said change-over switch is in a second position.

4,464,061

LINEARIZER CIRCUIT AND AN ELECTRONIC WATCH INCORPORATING SAME

Kenji Kamiya, Ena, Japan, assignor to Ricoh Watch Co., Ltd., Aichi, Japan

PCT No. PCT/JP80/00314, 371 Date Aug. 7, 1981, 102(e) Date Aug. 7, 1981, PCT Pub. No. WO81/01888, PCT Pub. Date Jul. 9, 1981

PCT Filed Dec. 19, 1980, Ser. No. 293,223

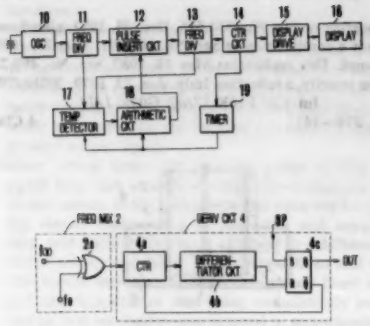
Claims priority, application Japan, Dec. 20, 1979, 54-164680; Jul. 7, 1980, 55-91706

Int. Cl.³ G04B *17/12, 17/20*

U.S. Cl. 368—202 **7 Claims**

1. A circuit comprising: a reference oscillator generating a preselected frequency; circuit means for generating a first frequency which changes in accordance with a change in a parameter; a frequency mixer having an output, said mixer effecting successive additions or subtractions of said first fre-

quency to or from the preselected frequency generated by the reference oscillator and applying the successive additions or



subtractions thereof at said output, and circuit means for producing an output pulse indicative of an average period of outputs from the frequency mixer.

4,464,062

BATTERY POWERED TIME PIECE

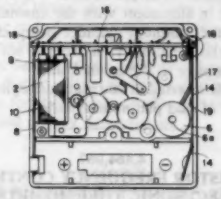
Kuniyoshi Inage, 393, Iwaicho, Hodogaya-ku, Yokohama-shi, Kanagawa, 240, Japan

Filed Oct. 23, 1981, Ser. No. 314,410

Claims priority, application Japan, Jul. 10, 1981, 56-101786; Jul. 10, 1981, 56-101787; Jul. 10, 1981, 56-101788; Jul. 10, 1981, 56-101789

Int. Cl.³ G04B *19/02*

U.S. Cl. 368—220 **6 Claims**



1. In combination with a time piece, a slip device comprising: a minute wheel; a minute shaft having a flange at one end portion thereof, said flange having a diameter smaller than said minute wheel, said minute wheel being in abutting engagement with said flange on a first side thereof; and resilient means abutting against said flange on a second side thereof, said resilient means including an annular relatively thin plate having an outside diameter larger than that of said flange and engaged around said minute shaft, said annular plate being formed with a pair of substantially semi-circular symmetric slots to define an outer annular portion, said outer annular portion being connected to the minute wheel at a plurality of locations thereof.

4. In combination: a printed circuit board, a battery and a terminal plate structure for establishing electrical connection across said printed circuit board and said battery in a timepiece, a movement casing of said timepiece having first and second projections protruding from inside walls thereof, said terminal plate structure comprising a pair of strip-shaped elastic members having inverted U-shaped notches respectively arranged substantially in intermediate portions thereof, said notches engaging said projections, each strip-shaped elastic member being notched to form an L-shaped portion at a first end thereof, said L-shaped portion being bent at an obtuse angle inwardly of the movement casing, said L-shaped portion being formed at an end thereof with a tongue-shaped portion which is bent inwardly substantially at a right angle thereto, whereby said strip-shaped elastic members pressingly hold said printed circuit board due to the resiliency of said L-shaped portions and, at the same time, electrically contact said printed circuit board.

6. In combination with a timepiece: an integral molding of a stub, a correction wheel, a rotary shaft, and a thumb piece for correction, said rotary shaft being locally thinned at a portion thereof adjacent said thumb piece so as to have a pair of parallel flat surfaces; and a cover for a movement casing of said timepiece formed with a first circular opening permitting passing of the correction wheel therethrough, said cover having a slot extending from said first opening of the cover to permit the thinned portion of the rotary shaft to move therein, and said cover also having a second circular opening of a diameter smaller than said first circular opening at which said slot terminates and which permits the rotary shaft to rotate therein.

4,464,063

WATCH CASE COMPRISING RESILIENT U-SHAPE CLAMPING MEMBERS CONNECTING CRYSTAL AND CASE

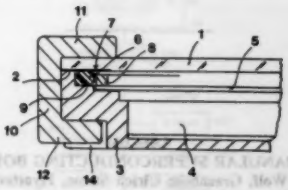
Paul Gogniat, Bienne, Switzerland, assignor to Montres Rado S.A., Longeau, Switzerland

Filed Nov. 30, 1982, Ser. No. 445,730

Claims priority, application Switzerland, Dec. 2, 1981, 7706/81

Int. Cl.³ G04B *37/00*

U.S. Cl. 368—276 **6 Claims**



1. A watch case comprising a crystal and a casing having an upper peripheral surface, said casing having a lower recessed peripheral surface, said upper peripheral surface terminating inwardly in a recessed seating surface, a resilient sealing member located in said seated surface having a height exceeding the depth of said recessed seating surface, said crystal being placed on said upper peripheral surface compressing said resilient sealing member, and connecting members comprising U-shaped clamps clamping said crystal and casing together and compressing said resilient sealing member, said U-shaped clamps being resilient and having one leg each bear against said lower recessed peripheral surface and the other leg each bear against the top of said crystal.

4,464,064

TEMPERATURE CONTROL MONITOR

John S. D'Luzansky, Franklin, Ohio, assignor to Packaging Industries, Inc., Hyannis, Mass.

Filed Apr. 19, 1982, Ser. No. 369,403

Int. Cl.³ G01K *3/02, 11/12*

U.S. Cl. 374—101 **9 Claims**

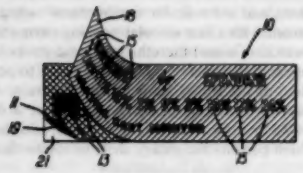
1. A temperature control cost monitor for indicating cost savings or excess including:

temperature responsive means including an output characteristic that varies with temperature and visible means responsive to the output characteristic for providing a visible indication changing with temperature;

means calibrating the visible means in units of savings and

excess of relative energy costs below and above a preselected temperature;

the visible means including a positionally variable indication and the means calibrating inncluding indicia associated with the positionally variable indication and indicating percentages increasing from 0% to each side of the location of the positionally variable means location of the preselected temperature;



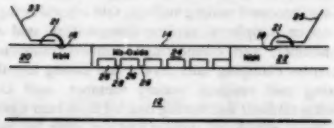
the visible means including the positionally variable indication comprising an array of temperature responsive liquid crystals with varying temperature-dependent visible characteristics, and the means calibrating including an overlay sheet that is at least partly light-conductive and has the indicia thereon in association with the crystal array and increasing in each direction from a preselected standard temperature.

4,464,065

FAST GRANULAR SUPERCONDUCTING BOLOMETER

Stuart A. Wolf, Greenbelt; Ulrich Strom, Hyattsville, both of Md., and Kurt Weiser, Haifa, Israel, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 9, 1982, Ser. No. 406,428
Int. Cl.³ G01N *25/20*
U.S. Cl. 374—121 8 Claims



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1. A bolometer, comprising:

a substrate of material that is thermally conductive but electrically insulating;

a superconducting granular thin film formed by partially anodizing a continuous thin film of the material of the grains of said granular thin film, said continuous thin film being deposited upon said substrate;

two spaced electrical contacts to said granular film;

cooling means for maintaining said substrate at a substantially constant temperature near the superconducting transition temperature of said grains;

a biasing network for impressing a current through said granular film; and

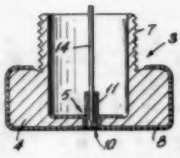
a detecting network for measuring resistance changes in said granular film.

4,464,066

PROBE TERMINAL FOR TEMPERATURE MEASURING IN ENAMELLED REACTORS

Giorgio Cappuccilli, Perugia, Italy, assignor to Tycon S.p.A., Italy

Continuation of Ser. No. 334,546, Dec. 28, 1981, abandoned, which is a continuation of Ser. No. 108,391, Dec. 28, 1979, abandoned. This application May 18, 1983, Ser. No. 495,220
Claims priority, application Italy, Jan. 22, 1979, 20556/79[U]
Int. Cl.³ F16K *37/00*; G01K *1/14*
U.S. Cl. 374—141 4 Claims



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1. A terminal for measuring the temperature inside of an enamelled reactor, allowing a high speed of response to change in temperature, and for detecting possible damage to the enamel comprising:

a hollow cylindrical metal body provided at one end with a base having a bore and provided at the other end with means to anchor said body to a probe;

a platinum cylinder provided with a base and inserted in said bore of said metal body base, the bases of said metal body and of said platinum cylinder being on the same side;

an enamel coating the external surface of said body and the walls of the said bore, the corresponding walls of the platinum cylinder being mutually anchored in place by the enamel; the outer surface of the platinum cylinder base being uncoated, in direct contact with the liquid in the reactor and in alignment with the enamelled base of the body, and the platinum cylinder being electrically insulated from the metal body, in order to act as an electrode to detect damage to the enamel; and

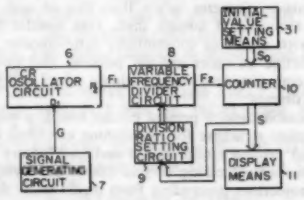
a thermocouple inserted in said platinum cylinder and placed on the base of said platinum cylinder.

4,464,067

THERMISTOR FREQUENCY CONTROLLED ELECTRONIC THERMOMETER

Tadashi Hanaoka, Tanashi, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Filed Jan. 21, 1983, Ser. No. 460,085
Claims priority, application Japan, Jan. 22, 1982, 57-8649; Feb. 9, 1982, 57-19162
Int. Cl.³ G01K *7/24*; G05B *11/26*
U.S. Cl. 374—170 15 Claims



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1. A thermistor thermometer, comprising:

a capacitance-resistance oscillator circuit comprising a frequency-determining time constant circuit including a thermistor;

signal generating circuit means for producing a plurality of signals including a control signal coupled to said capaci-

tance-resistance oscillator circuit for controlling said capacitance-resistance oscillator circuit such as to operate only during repetitively occurring oscillation time intervals, each of said oscillation time intervals being of fixed duration;

variable division ratio frequency divider circuit means capable of being present to a plurality of different frequency division ratios, coupled to receive and perform frequency division of an oscillation signal produced by said capacitance-resistance oscillator circuit during each of said oscillation time intervals, for thereby producing a frequency divided output signal;

counter circuit means for counting pulses of said output signal from said variable division ratio frequency divider circuit means, and responsive to said counting for producing signals representing address data and temperature data, said address data being changed to a different value each time the number of pulses output from said vfo circuit means increases by a predetermined fixed amount, and said temperature data being cumulatively increased during said oscillation time interval in accordance with a cumulatively increasing count of the number of output pulses from said variable division ratio frequency divider circuit means;

division ratio setting means coupled to control the frequency division ratio of said variable division ratio frequency divider circuit, and responsive to said address data for setting said frequency division ratio to a corresponding one of a plurality of frequency division ratios in accordance with the value of said address data;

initial value setting means for setting an initial value for said temperature data into said count circuit means prior to each of said oscillation time intervals, in response to a timing signal from said signal generating circuit means;

display means comprising latch circuit means coupled to said counter circuit means and responsive to a sampling signal produced by said signal generating circuit means for storing said temperature data from said counter circuit means at the end of each of said oscillation time intervals, decoder driver circuit means coupled to receive said temperature data from said latch circuit means for thereby producing display drive signals, and electro-optical display means for displaying a value of temperature in response to said display drive signals.

4,464,068

FOIL SLIDING BEARING IN PARTICULAR FOR PUMPS USED IN CHEMICAL PROCESSES

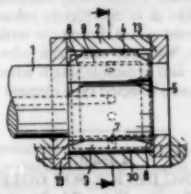
Franz Potrykus, Universitätsstrasse 75, 4630 Bochum 1, Fed. Rep. of Germany

Filed Dec. 10, 1979, Ser. No. 101,519

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1978, 2853146

Int. Cl.³ F16C *32/06*

U.S. Cl. 384—103 **13 Claims**



1. A foil sliding bearing for a rotating member journaled in a coaxial, generally cylindrical bearing housing in a glandless rotary pump used in chemical processes and lubricated by the liquid to be pumped, which comprises:

(a) a bearing sleeve positioned between said rotatable member and said bearing housing; and

(b) a plurality of sliding foil sections formed of plastic material carried by said bearing sleeve on the outer surface thereof, each of said foil sections:

(i) being secured at its front end only, as seen in the direction of rotation, in an axial slot formed in the bearing sleeve, which slot does not extend out to either edge of said sleeve,

(ii) bearing loosely against the bearing sleeve at its rear end, and

(iii) leaving an expansion gap free at its rear end with respect to the next adjacent foil section.

4,464,069

PRINTING APPARATUS DISPLAY DEVICE FOR SIMULTANEOUSLY DISPLAYING COMPLETE WORDS

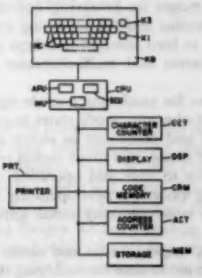
Yasuaki Yamada, Matsudo; Toshiaki Ozawa, Higashi, and Hiroatsu Kondo, Zushi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 241,427, Mar. 6, 1981, abandoned. This application Jun. 10, 1983, Ser. No. 501,753

Claims priority, application Japan, Mar. 17, 1980, 55-32791

Int. Cl.³ B41J *29/42*

U.S. Cl. 400—83 **8 Claims**



1. A display device, comprising:

memory means for storing a sentence comprising plural groups of characters separated by spaces or punctuation marks;

readout means for reading the sentence from said memory means;

display means having a first end and a second end defining therebetween a limited number of places for displaying at least a portion of the sentence read by said readout means;

identifying means for identifying in a portion of a sentence initially displayed by said display means, the one of the spaces and of the punctuation marks located directly before one of said plural groups of characters comprising said sentence that is interrupted by said second end of said display means, irrespective of the length of said one of said plural groups of characters; and

applying means for subsequently supplying to said display means from said memory means another portion of the sentence beginning with said one of said plural groups of characters which was initially interrupted by said second end of said display means and following the one of said spaces and punctuation marks identified by said identifying means, whereby at least said one of said plural groups of characters is displayed in its entirety provided said one of said plural groups of characters it does not comprise a number of characters greater than said limited number.

4,464,070

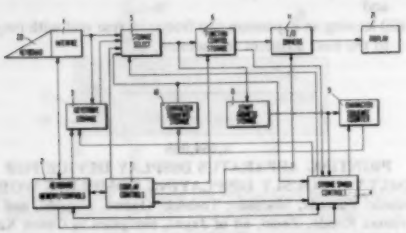
MULTI-CHARACTER DISPLAY CONTROLLER FOR TEXT RECORDER

Roy F. Haaft, and Gerald G. Pechanek, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 107,467, Dec. 26, 1979, abandoned. This application Jun. 30, 1982, Ser. No. 393,981

Int. Cl.³ B41J *3/02*

U.S. Cl. 400—98 19 Claims



1. A multi-character display controller for use in a text recorder of the kind having:

(1) a text display means for displaying character sequences;

(2) keyboard means including a plurality of keys each producing a coded signal representing said key when actuated by an operator; and

(3) decoder means for receiving coded signals from said keyboard means and for supplying corresponding drive signals for at least some of said keys to said text display means, wherein said multi-character display controller includes:

mode means for producing a mode signal having normal and multi-character mode states to control an operating mode of said controller as either a normal or multi-character mode, said mode means responsive to operation action to alter said operating mode from a prior operating mode to a new operating mode and to maintain said new operating mode until further operator action,

first means, responsive to said mode signal in a multi-character mode state for nullifying the normal response of said decoder means to at least a subset of said coded signals, and

auxiliary means and storage means associated with said auxiliary means, said storage means retrievably storing signals representing preselected character sequences at locations corresponding to respective coded signals of said subset, said auxiliary means responsive to said mode signal in a multi-character mode state and to said storage means for supplying to said text display means drive signals representing a preselected character sequence corresponding to that defined by signals read from said storage means,

in which said decoder means includes a function means for correlating at least some of said coded signals with associated drive signals and wherein said storage means includes:

first memory means addressed by said coded signals including an entry for at least each of said coded signals in said subset,

counter means responsive to said first memory means for storing signals representing said entry,

second memory means addressed by said counter means including an entry for each of said coded signals in said subset, a first sub-entry located at a location designated by an entry from said first memory means, each said entry including a stop code as a final sub-entry,

control means responsive to said second memory means for incrementing said counter means each time an output is produced by said second memory means, said control means responsive to a stop code read from said second memory means for inhibiting further incrementing of said counter means,

and wherein said auxiliary means includes means for supplying outputs from said second memory means to address said function means.

4,464,071

DETENT APPARATUS FOR PRINT WHEEL

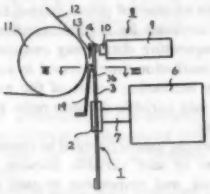
Kenji Sakakibara, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 246,394, Mar. 23, 1981, abandoned. This application Feb. 24, 1983, Ser. No. 469,997

Claims priority, application Japan, Apr. 15, 1980, 55-50195

Int. Cl.³ B41J *1/30*

U.S. Cl. 400—144.2 10 Claims



1. A serial printer for printing on a surface of a paper mounted on a platen, comprising

a stepping motor having a stator and a rotor provided with a shaft which extends outwardly and rotates with said rotor;

a print wheel having a central part directly fixed on said shaft of said rotor and a plurality of spokes each of which has an end integral with said central part and another end provided with a portion bearing a particular type element, each type element on said print wheel capable of facing a printing point on said paper according to the rotation of said rotor;

a print hammer movable toward said printing point for striking a selected type element on said print wheel;

means for positioning accurately said selected type element struck by said print hammer so that said selected type element comes into contact with said printing point on said paper, said means co-acting with the spoke bearing said selected type element to be struck against said paper so as to guide said selected type element toward said printing point during the striking action of said print hammer; and

control circuit means for selectively driving said printing hammer and selectively energizing said motor in order to rotate said print wheel to a position whereat said selected type element may be struck by said print hammer and in order to hold said selected type element at said position, said control means momentarily releasing the energization of said motor so as to completely release a holding force against said print wheel during the striking action of said print hammer, whereby said print wheel may be rotated slightly with said rotatable shaft when said positioning means moves said selected type element toward said printing point.

4,464,072

CLEANING DEVICE FOR GOLF CLUBS

John B. Norwell, Taunton Ridge Rd., Newtown, Conn. 06470

Filed Apr. 21, 1982, Ser. No. 370,343

Int. Cl.³ A46B *11/02*

U.S. Cl. 401—137 4 Claims

1. A golf club cleaning device capable of releasably engaging the wall of a golf bag, comprising: a liquid dispensing means comprising a liquid container and liquid spray means,

the container having a front wall facing away from the wall of the golf bag and a rear wall including outwardly projecting portions facing the wall of the golf bag; retaining means for holding the dispensing means and attaching it to the wall of a golf bag, the retaining means comprising a sleeve defining an opening to receive the dispensing means, the sleeve having a rear-wall including outwardly projecting portions facing the wall of the golf bag; generally U-shaped clip means adapted to slip over the edge of a wall of a golf bag, and a generally U-shaped support release extending downwardly from points of attachment to front and rear walls of the sleeve; and brush means associated with the liquid dispensing and retaining

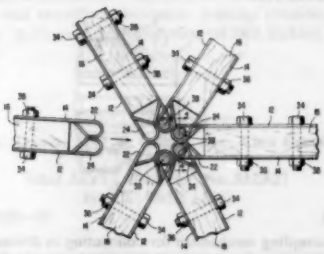
means, the brush means having bristles facing outwardly; the projections on both the rear wall of the container and the rear wall of the sleeve being adapted to releasably engage a golf bag wall having a beaded upper edge, the projections preventing movement of the device past the beaded upper edge of the golf bag under normal conditions, but configured such that when the support release is pressed inwardly toward the golf bag wall, the device is pivoted about the outwardly projecting portions on the rear wall of the sleeve to move the outwardly projecting portions on the rear wall of the container from engagement with the golf bag wall to permit removal of the container from the retaining means.

4,464,073

CONNECTORS FOR GEODESIC DOME STRUCTURES

Arthur R. Cherry, 4050 Wetumpka Hwy., Montgomery, Ala. 36110

Filed Nov. 4, 1982, Ser. No. 439,286
Int. Cl.³ E04B *1/32*
U.S. Cl. 403—170 **5 Claims**



1. A connector assembly for connecting a plurality of framing struts of a space frame geodesic dome in which said struts radiate from a common point comprising:

a connector element for each said strut, each element having a mounting portion adapted to be secured to the corresponding strut and, adjacent the end of said strut, first and second sets of semicylindrical portions located, respectively, on opposite sides of and externally tangent to the longitudinal centerline of said strut, the semicylindrical portions of said first set alternating with those of said second set whereby, in an assembled connection, the first set of each element is interleaved with the second set of the adjacent element forming a hinge-like knuckle joint;

means for affixing each said connector element to said corresponding strut; and

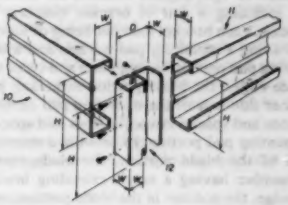
pin means adapted to extend through said interleaved first and second sets of semicylindrical portions.

4,464,074

CONNECTOR AND WEB STIFFENER

William J. Green, Lake Forest, and Ralph P. Semmerling, Mount Prospect, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Dec. 28, 1981, Ser. No. 334,776
Int. Cl.³ F16B *9/02*
U.S. Cl. 403—192 **5 Claims**



1. A connector for the interconnection in a mutually perpendicular array of at least first and second elongate generally C-shaped channel elements, each of said C-shaped channel elements having a web portion and a pair of generally parallel, spaced flanges connected along longitudinal sides of said web portion each of said flanges further including a flange return edge extending perpendicularly from a free edge of said flange inwardly of the generally C-shaped channel element and generally parallel to the web portion thereof, said connector comprising:

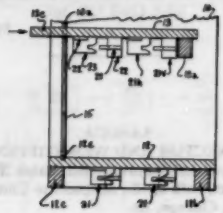
a tubular portion of generally rectangular cross-section, said tubular portion having spaced side and end walls and being dimensioned such that one of said end walls and both said side walls are received within said first C-shaped channel element between the flanges and adjacent the web of said first C-shaped channel element with said side walls of said tubular portion of said connector being perpendicular to the longitudinal length of said web and perpendicular to said flanges, said side walls of said tubular, generally rectangular portion of said connector having slots positioned to receive said return flanges of said first generally C-shaped channel element when said tubular, generally rectangular portion of said connector is received within said C-shaped channel element; and,

a generally channel-shaped portion including a connector web integral with, and being an extension of one of said side walls of said tubular, generally rectangular portion of said connector, and a connector flange secured at a first end to a free end of said connector web generally perpendicular thereto, said connector flange being parallel to the web of said first C-shaped channel element, said channel-shaped portion of said connector being dimensioned to be insertable within said second C-shaped channel element between the flanges thereof and perpendicular to the longitudinal length of said second C-shaped channel element.

4,464,075
KNOCKDOWN FITTINGS FOR KNOCKDOWN FURNITURE STRUCTURE

Harlan F. Kellogg, 1617 Sprucewood, Rockford, Ill. 61107

Filed Jul. 31, 1981, Ser. No. 288,890
Int. Cl.³ B25G 3/00; F16B 7/08
U.S. Cl. 403—231 14 Claims

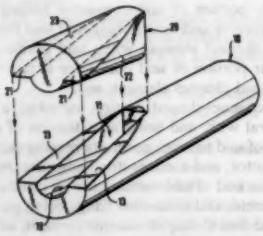


1. A knockdown fitting assembly for securely connecting a pair of panels in right angular relation, the knockdown fitting assembly including a pair of bracket members of the same configuration, each bracket member being of unitary construction and having a mounting pad portion and a blade portion, the mounting pad portion having inner and outer side faces and spaced side edges, the blade portion extending perpendicular to said inner side face of the mounting pad portion and medially between and spaced inwardly from said spaced side edges of the mounting pad portion, to provide a mounting flange at each side of the blade portion, the blade portion of each bracket member having a notch extending inwardly from a lead end edge, the notches in the blade portions of the bracket members being adapted to interfit when the pair of bracket members are moved along a path in one direction toward each other with the lead end edges of the blade portions of the pair of bracket members juxtaposed and with the blade portions of the pair of bracket members in relatively crossing right angular relation, the notches in the blade portion of each bracket member being spaced from its outer face a distance such that each bracket member has one side edge of its mounting pad portion disposed in a plane through the outer face of the mounting pad portion on the other bracket member when the notches in the blade portions of the pair of bracket members interfit.

4,464,076
EXPANSION DOWEL ASSEMBLY

Erich Leibhard, Munich, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Jun. 25, 1982, Ser. No. 392,252
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1981, 3125457
Int. Cl.³ F16B 2/14
U.S. Cl. 403—297 11 Claims

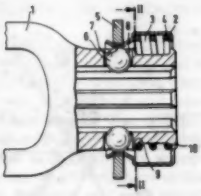


1. An exposure dowel assembly comprising an axially extending dowel body having a front and a rear end with the front end arranged to be inserted first into an opening into which the dowel assembly is to be inserted, and an axially extending expansion member having a front end and a rear end and arranged to be supported on said dowel body and to be displaced in the axial direction of the dowel body away from the rear end of said dowel body for anchoring said dowel body in the opening, said dowel body having engagement means adjacent the rear end thereof for applying axially directed forces to said dowel body, said dowel body having an axially extending support surface for said expansion member extending from a location intermediate the front and rear ends of said dowel body toward the front end and inclined at an angle to the axis of said dowel body, said dowel body and expansion member being engageable with one another to form an axially extending cylindrically shaped outer peripheral surface so that the dowel assembly can be inserted into a corresponding cylindrically shaped opening prior to being expanded, wherein the improvement comprises that said support surface is formed at least in part by a centrally arranged groove extending inwardly into and in the axial direction of said dowel body from the location intermediate the front and rear ends of said dowel body toward the front end thereof and the bottom of said groove being inclined relative to the axis of said dowel body for displacing said expansion member radially outwardly from the axis of said dowel body as said expansion member is displaced along said groove in the direction toward the front end of the dowel body, said groove having oppositely disposed side walls extending upwardly from the bottom of said groove and said side walls decreasing in height from the intermediate location to the front end of said dowel body, and said expansion member is shaped to fit into said groove in said dowel body in contact with said side walls in said groove and with said bottom and in the insertion condition of said expansion dowel assembly the front ends of said dowel body and expansion member are arranged transversely of the axis of said dowel body and the lateral outer surfaces of said dowel body and expansion member in the insertion condition form a continuous cylindrical surface.

4,464,077
COUPLING DEVICE FOR DRIVE SHAFTS

Paul Herchenbach, Ruppichteroth, and Mathias Konrad, Troisdorf, both of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed May 14, 1982, Ser. No. 378,419
Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120367
Int. Cl.³ F16B 7/00
U.S. Cl. 403—316 3 Claims



1. A coupling mechanism for connecting in driving engagement a sleeve and a shaft comprising: spherical locking means mounted on said sleeve and arranged to be movable radially inwardly and outwardly thereof into and out of locking engagement between said sleeve and said shaft; an annular locking member engaging said spherical locking means to hold said spherical locking means radially in locking position relative to said sleeve; said annular locking member being axially movable relative to said sleeve to release said spherical locking means to permit radial movement thereof out of said locking position; and spring means operatively interposed between said sleeve and said annular locking member to apply a spring force therebetween biasing said annular locking member into position

holding said spherical locking means in said locking position; said spring means being formed with first radial parts thereof in engagement with said sleeve and with second radial parts thereof in engagement with said annular locking member, said first and said second radial parts being radially displaced relative to each other; wherein said annular locking member extends about said sleeve, wherein said first radial parts of said spring means are in engagement with abutment means on said sleeve, and wherein said second radial parts of said spring means are in engagement with abutment means on said annular locking member, said first radial parts of said spring means being located radially outwardly of said second radial parts thereof, said spring means comprising a helical spring having at least the axial end coils thereof formed with a polygonal configuration with the radially outermost parts of said polygonal configuration being in engagement with said annular locking member and with the radially innermost parts of said polygonal configuration being in engagement with said sleeve.

4,464,078

LOCKING MECHANISM FOR TELESCOPED POLES

Michael Vorobyov, Brooklyn, N.Y., assignor to Unger Enterprises, Inc., Mount Vernon, N.Y.

Filed Oct. 17, 1983, Ser. No. 542,342
Int. Cl.³ B25G *3/00*; F16D *1/00*
U.S. Cl. 403—351 **8 Claims**

1. In a locking mechanism for telescoped poles of the type including a body having an eccentric cam surface carried along a portion of an inner one of the poles, and a roller movable along the rise of said eccentric cam upon rotational movement of said pole relative to an outer tubular pole in telescoped relation therewith;

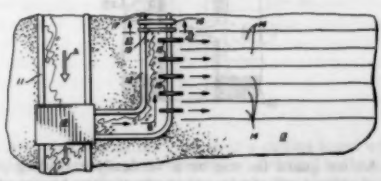
the improvement comprising a continuous series of circumferentially spaced axially and radially inwardly extending surface discontinuities on the inner surface of said outer pole and providing abutments resisting rotation of said roller in an unlocking direction of said locking mechanism.

4,464,079

IRRIGATION SYSTEM

James M. Chance, 1741 N. Gilbert Ave., Casa Grande, Ariz. 85222

Filed Jul. 11, 1983, Ser. No. 512,627
Int. Cl.³ E02B *13/00*
U.S. Cl. 405—37 **2 Claims**



1. An irrigation system including

(a) a primary canal having water traveling therethrough at a first rate of flow;

(b) a secondary canal having generally enclosed ends such that a flow of water entering said secondary canal accumulates therein and eventially overflows said canal unless a sufficient volume of said water is removed therefrom;

(c) means for diverting water from said primary canal to said secondary canal at a selected second rate of flow, said second rate of flow through said diverting means into said secondary canal increasing when the rate of flow of water through said primary canal increases from said first rate of flow of water therethrough;

(d) means for transferring water from said secondary canal into a field adjacent said secondary canal, said transferring means removing water from said secondary canal at a rate generally equivalent to said second rate of flow of water into said secondary canal such that said secondary canal is prevented from filling and overflowing;

(e) means for monitoring the level of water in said secondary canal such that an alarm is activated when

(i) the rate of flow of water through said primary canal increases beyond said first rate of flow,

(ii) the rate of flow of water into said secondary canal therefore increases to a rate of flow greater than said second rate of flow, and

(iii) said rate of flow of water through said transferring means into said field is therefore less than said increased rate of flow of water into said second canal and permits said water level in said secondary canal to rise past a selected level,

said monitoring means including

(iv) an elongate member adapted to span said secondary canal,

(v) alarm means, and

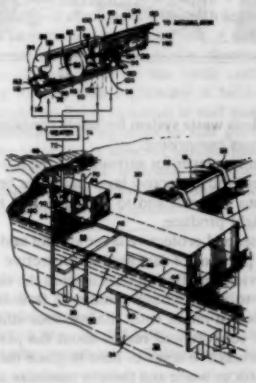
(vi) means carried on said elongate member for detecting when said water level in said canal rises above a selected level and for activating said alarm means when said water level in said canal rises above said selected level.

4,464,080

HIGH VOLUME TIDAL OR CURRENT FLOW HARNESSING SYSTEM

Alexander M. Gorlov, 234 Main St., Medford, Mass. 02155

Continuation of Ser. No. 65,114, Aug. 9, 1979, abandoned. This application Jan. 11, 1982, Ser. No. 338,482
Int. Cl.³ E02B *9/08*; F03B *13/12*
U.S. Cl. 405—76 **10 Claims**



3. Apparatus for extracting power from ocean tides, ocean currents or flowing rivers comprising:

means including a dam interposed in a water flow path for

creating a water head between water at one level on one side of the dam and water at another level on the opposite side of the dam; and,

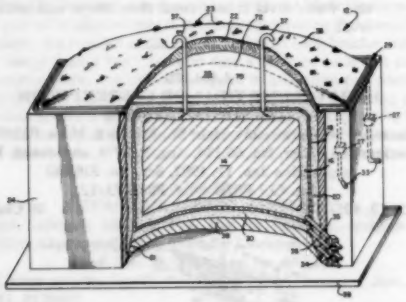
means for cyclically creating positive gas pressure and a partial vacuum responsive to water flow from one side of said dam to another side thereof including a housing having a bottom submerged in water, with said bottom having parts at the bottom thereof, said housing having barrier means for separating the bottom of said housing into two chambers, each with a separate set of ports and means for alternately sealing the top of one chamber while unsealing the top of the other chamber to promote filling of said housing with water to create a positive gas pressure at the top of said housing and to promote the production of a partial vacuum at the top of said housing with water outflow, said alternate sealing and unsealing means including at least one structure having a central axis about which it may be rotated so as to selectively seal one of said chambers and at least another of said structures having a central axis about which it may be rotated so as to selectively seal the other of said chambers, and means for mounting and actuating said structures so as to seal and unseal opposing chambers responsive to the water level in said housing.

4,464,081

PROCESS AND STRUCTURE FOR STORING AND ISOLATING HAZARDOUS WASTE

Edward Hillier, Baytown; Larry Graybill, Houston; Richard Winders, La Porte; Dan Bridge, Friendswood, and Joe Dauchy, Bellaire, all of Tex., assignors to Rollins Environmental Services, Inc., Wilmington, Del.

Filed Jun. 29, 1983, Ser. No. 509,137
Int. Cl.³ B65G *5/00*
U.S. Cl. 405—128 **26 Claims**



1. A hazardous waste system for safely containing hazardous waste substances comprising:

a first protective layer for surrounding the hazardous waste;

a liner around the protective layer, said liner being relatively impervious to water and to leachates that the hazardous waste might produce;

a pervious second protective layer around said liner, the top and side portions of said second protective layer providing a pervious infiltration layer around the sides and top of the liner to permit the gravitational flow and run off of any fluids that might enter the pervious infiltration layer;

a perimeter support wall means about the periphery of the second protective layer to hold in place the layers, liner, and hazardous waste and thereby minimize any horizontal slippage of the hazardous waste;

a cap over the second protective layer to protect the hazardous waste from the surface environment; and

a monitoring system means for providing for the gravitational flow and run off of any water and leachates on the cap, in the liner, or in the first or second protective layers;

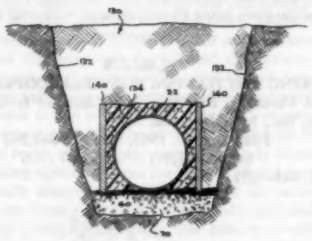
a support base under the liner, layers, and perimeter support wall means and proximate to the surface of the ground, said support base including an impervious top surface above the ground and providing a barrier between the ground and hazardous waste.

4,464,082

CHILLED GAS PIPELINE INSTALLATION AND METHOD

Ralph M. Isaacs, Bellevue, Wash., assignor to Northwest Alaskan Pipeline Company, Salt Lake City, Utah

Filed May 13, 1983, Ser. No. 494,415
Int. Cl.³ E02D *19/14*; F16L *1/00*
U.S. Cl. 405—157 **19 Claims**



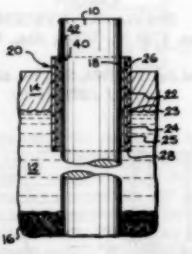
1. A chilled media carrying pipeline installation comprising an earth-covered buried pipe member and insulation means covering the upper half and a portion of the lower half of the buried pipe member, the lowermost bottom portion of the buried pipe member being bare of insulation means, and wherein the insulation means provides sufficient resistance to heat flow from the earth above the pipe into the pipe to permit the earth above the insulation means to thaw from the surface down to the insulation means during periods of warm weather while chilled media flowing through said buried pipe member maintains the area immediately beneath the pipe in a permanently frozen condition.

4,464,083

ICE GUARD FOR PROTECTING PILINGS

John G. Wathey, 2251 E. Country Club Pkwy., Toledo, Ohio 43614

Filed Aug. 25, 1982, Ser. No. 411,240
Int. Cl.³ E02B *15/02*; E02D *5/60*
U.S. Cl. 405—216 **14 Claims**



1. An ice guard for use on a vertically extending piling positioned in a body of water, the body of water having a layer of ice on its surface, said ice guard comprising, in combination, a longitudinally extending sleeve assembly having a cross-sec-

tion complimentary with a cross-section of the piling, said sleeve assembly extending above the surface of the body of water, said sleeve assembly comprising telescoping inner and outer sleeves, said sleeves being movable vertically relative to one another, whereby upon freezing said inner sleeve is attached to the piling and said outer sleeve is attached to the ice layer of the body of water, and rib means on said sleeves to enhance adhesion of said sleeves to the ice.

4,464,084

SHORING SUPPORTS

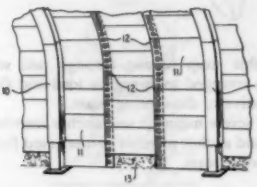
Jan C. Wozniak, Douglas, Isle of Man, assignor to Serni Limited, Douglas, Isle of Man

Filed Nov. 18, 1982, Ser. No. 442,587

Claims priority, application United Kingdom, Dec. 1, 1981, 8136222

Int. Cl.³ E21D *11/15*

U.S. Cl. 405—288 **5 Claims**



1. A tunnel wall shoring panel comprising:

a substantially flat member of metal of generally rectangular outline and having at least two opposed sides each having at least one detent for connection with the corresponding detents of a similar panel for retaining the panels in general alignment,

the detents each comprising a tongue defined by slots in the form of an inner T-shaped slot having a crossbar disposed parallel to the adjacent edge of the panel and a leg disposed perpendicular to and extending away from the said adjacent edge and a C-shaped outer slot having a concave side directed towards the said adjacent edge and embracing the leg of the T-shaped slot,

the tongue being defined between the slots and comprising a generally U-shaped strip and further being displaced from the plane of the panel into a generally parallel plane.

4,464,085

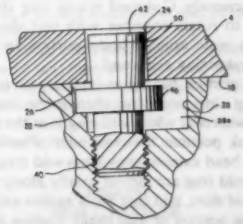
PIN LOCK CUTTING TOOL

Shivdas A. Kalokhe, Clinton, Canada, assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Oct. 13, 1982, Ser. No. 434,153

Int. Cl.³ B26D *1/00*

U.S. Cl. 407—105 **2 Claims**



1. A cutting tool of the type using a cutting insert with an axial hole therethrough comprising (a) a toolholder having an insert seating surface means on which the cutting insert is supported and an abutment surface means inboard on the seating surface means and against which the cutting insert is held, said toolholder having a retention pin-receiving cavity on said seating surface means including a tapped hole having a longitudinal axis, a circular cross-section bore intersecting with said tapped hole and having a longitudinal axis offset from the axis of said tapped hole toward said abutment surface means and of lesser depth than said tapped hole, and another circular cross-section bore substantially coaxial with said tapped hole and of lesser depth than the offset bore and intersecting therewith such that a portion of said another bore forms a crescent-shaped recess extending outboard from the offset bore above said tapped hole in a direction away from said abutment surface means and having a crescent-shaped recess bottom and the remaining portion of said another bore is within the offset bore, and (b) a retention pin having a threaded portion at one end threadable into said tapped hole, an insert-engaging portion at the other end received in the axial insert hole and an intermediate annular flange between the ends engageable with said crescent-shaped recess bottom as the pin is threaded into the toolholder, causing the pin to tilt toward the abutment surface means with said insert-engaging portion of the pin forcing the cutting insert against said abutment surface means.

4,464,086

HOB WITH CUTTING PLATES

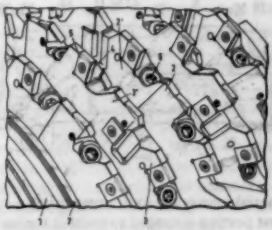
Bernd Bentjens, Schwarzenbek, Fed. Rep. of Germany, assignor to Wilhelm Fette GmbH, Schwarzenbek, Fed. Rep. of Germany

Filed Oct. 14, 1981, Ser. No. 311,297

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1980, 3039076

Int. Cl.³ B26D *1/12*

U.S. Cl. 407—25 **11 Claims**



1. A hob for making gears, comprising a cylindrical base element; a plurality of even, helix-like tooth segments mounted on said base element and each carrying a number of tooth cutters with reversible cutting plates thereon; means for mounting the cutting plates on the tooth cutters; said base element being formed with a plurality of helix-shaped guide means, said segments being mounted in said guide means; and means for mounting the segments in said guide means, said segments being arranged in adjacent parallel rows on said base element, the cutters of the segments positioned in adjacent rows being displaced in a twist-like manner relative to an axis parallel directrix of the base element.

4,464,087

CUTTING TOOL

Jean-Marc Muller, Sévery, Switzerland, assignor to Stellram S.A., Nyon, Switzerland

Filed May 11, 1982, Ser. No. 377,256

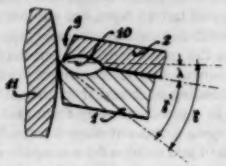
Claims priority, application Switzerland, Feb. 12, 1982, 876/82

Int. Cl.³ B26D *1/00*

U.S. Cl. 407—113 **11 Claims**

1. A cutting tool adapted to be secured to a tool holder, comprising at least one first cutting edge adapted to enter into

contact with the piece to be machined and at least one second cutting edge located along at least a portion of its length behind the first cutting edge, these two edges defining between themselves a slot giving access to a channel provided in the



tool, said channel extending along the slot and being open at at least one of its ends, the channel having a cross section which is elongated in the direction away from said cutting edges, said cutting edges lying in a plane which extends lengthwise of said cross section of the channel.

4,464,088

DEVICE FOR MAKING HOLES

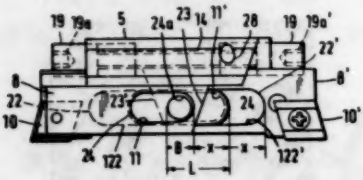
Dieter Dehn, Frankfurt am Main, Fed. Rep. of Germany, assignor to Stellram GmbH, Heusenstamm, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,633

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1982, 3204922

Int. Cl.³ B23B *29/03*

U.S. Cl. 408—182 **10 Claims**



1. A material removing tool, comprising a rotary support having a first portion arranged to receive torque from a prime mover and a second portion having a guide groove and two legs flanking said groove; a pair of elongated knife holders movable in and lengthwise of said groove substantiallytransversely of the axis of said support and having elongated slots extending in the longitudinal direction thereof, said holders having abutting surfaces and said slots having ends in the respective abutting surfaces; means for clamping said holders in said groove, including an elongated member extending with clearance through said slots so that portions of said ends of said slots remain exposed, at least in certain positions of said holders with reference to each other; and intercepting means interposed between said holders and arranged to close said exposed portions of said ends of said slots.

4,464,089

LOAD LASHING TUBULAR ANCHOR FOR SHORING BEAMS

Daniel G. Allen, 28340 E. Abernathy La., Welches, Oreg. 97067

Filed Aug. 16, 1982, Ser. No. 408,618

Int. Cl.³ B60P *7/10, 7/14, 45/00*

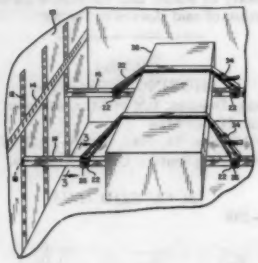
U.S. Cl. 410—97 **3 Claims**

1. A cargo restraining system comprising

(a) at least one rectangular shoring beam arranged to be secured to side walls of a transporting vehicle,

(b) at least one tubular anchor member having a rectangular opening therethrough for slidably mounting said anchor member on said shoring beam,

(c) a strap confining opening forming a groove extending through said anchor member in parallel relation to said rectangular opening,



(d) a flexible strap passing through said strap confining opening arranged to engage a load and firmly bind the load relative to the shoring beam,

(e) and set screw means in said anchor member arranged to secure said anchor member in a selected fixed position on said shoring beam.

4,464,090

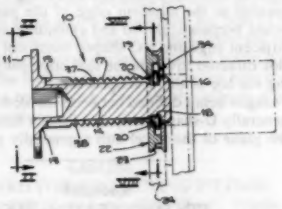
CAPTIVE PANEL FASTENERS

John A. Duran, Glendora, Calif., assignor to Avibank Mfg., Inc., Burbank, Calif.

Filed Aug. 20, 1982, Ser. No. 410,068

Int. Cl.³ F16B *43/00*

U.S. Cl. 411—103 **16 Claims**



1. In a captive panel fastener comprising a threaded shank portion, an enlarged head at one end of said shank portion, the improvement which comprises:

said retaining member including a grommet assembly trapping a generally C-shaped spring ring therein, said ring adapted to rotate together with said shank portion and having a main arcuate body portion terminating in inwardly extending ends; and

said shank portion having at least a pair of longitudinally extending slots receiving therein the ends of said ring therein whereby, when said ring is at the terminal end of said shank portion, the remainder of said shank portion and said head extend away from said ring, and when the ends of said ring are moved axially along said shank portion in said slots, said ring abuts against said head with the remaining portion of said shank portion extending away from said head and said ring; and

said shank portion having reduced section means of lesser diameter than the major diameter of said shank portion through said slots at the terminal end of said shank portion configured to receive said ring therein thereby allowing the ring to grab or bite down within said reduced section

means to maintain said shank portion in a position extending outwardly from said grommet assembly.

4,464,091

CAPTIVE FASTENER

Jorge W. Molina, Torrance, Calif., assignor to Deutsch Fastener Corp., El Segundo, Calif.

Division of Ser. No. 224,057, Jan. 12, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 431,714

Int. Cl.³ F16B *37/04*

U.S. Cl. 411—105 **9 Claims**

1. In combination with a screw device having a screw with a threaded shank and a retainer for said screw, a nut assembly comprising

a sleeve,

said sleeve including means for attachment to a workpiece, and an internally threaded member,

said sleeve having an opening therethrough having a noncircular portion of a first length adjacent one end of said sleeve, and an interior portion inwardly of said noncircular portion,

said member having a noncircular exterior surface portion received in said noncircular portion of said opening, whereby said member is prevented from substantial rotation relative to said sleeve,

said noncircular portion of said member being of a second length which is greater than said first length, whereby said member has freedom for limited axial movement relative to said sleeve and portions of said member can extend into said interior portion of said opening,

said member having a first abutment exteriorly of said sleeve and a second abutment in said interior portion of said opening,

said sleeve having a first abutment engageable by said first abutment of said member when said threaded shank is tightened into said member, said sleeve having a second abutment interiorly thereof engageable by said second abutment of said member when said threaded shank is loosened with respect to said member.

4,464,092

BOAT TRAILER

J. Bruce Chambers, Rte. #1, Lindenhurst Rd., and Donald D. Paul, 1060 Creamery Rd., both of Yardley, Pa. 19067

Filed Feb. 5, 1982, Ser. No. 345,999

Int. Cl.³ B60P *3/10*

U.S. Cl. 414—534 **22 Claims**

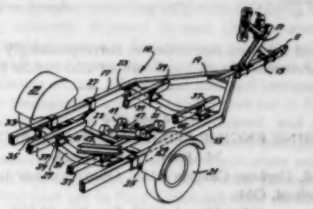
1. A boat trailer for carrying a boat and for loading and unloading said boat, said trailer including a wheel support frame having a pair of side rails; means for hitching said trailer frame to a towing vehicle and means for cradling said boat, the improvement comprising:

a pair of hanger brackets, one each attached to each of said side rails, each said hanger bracket being attached to its respective side rail by a single pin, said bracket extending below its respective side rail;

a positioning bar attached to the back face of each hangar bracket, said positioning bar abutting the underside of said side rail and holding said hanger bracket in fixed position to said side rail when said bracket is pinned thereto;

a downwardly bowed cross rail rigidly fixed between said pair of hanger brackets at said position on said brackets extending below said side rails; and

wherein said cradling means includes a plurality of roller support means for carrying the weight of said boat, each



of said roller support means being independently rotatable in a longitudinal axis of said trailer and being independently positionable along said cross rail.

21. A towable boat trailer, said trailer including a wheel and axle subassembly, at least one longitudinal support rail mounted on said wheel and axle subassembly, means for hitching said support rail to a towing vehicle, and means for cradling said boat being connected to said support rail, the improvement comprising:

wherein said cradling means includes a plurality of levers each extending in planes transverse to a longitudinal axis of said trailer, and including a boat contacting member, said levers each having an I-beam shape with a channel extending along the top flange, said channel being formed by the upstanding lips of said flange, said boat contacting member being received in said channel.

4,464,093

POWER SHOVEL HAVING IMPROED HOIST SYSTEM

George B. Baron, and George J. Thompson, both of Marion, Ohio, assignors to Dresser Industries, Inc., Dallas, Tex.

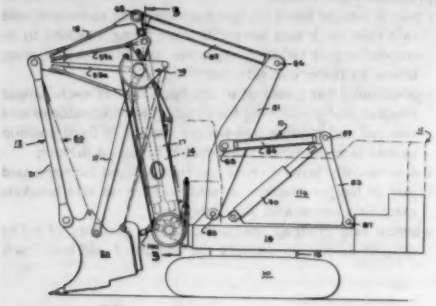
Filed Oct. 6, 1978, Ser. No. 948,805

Int. Cl.³ E02F *3/32*

U.S. Cl. 414—687 **22 Claims**

1. A power shovel comprising a support unit, a stiffleg operatively connected to said support unit for pivotal movement about a stiffleg pivot axis, a handle operatively connected to said stiffleg for pivotal movement about a handle pivot axis, a dipper mounted on said handle, a crowd system operatively connected to said handle for crowding and retracting said dipper and a hoist system for hoisting and lowering said dipper comprising at least one upper fluid actuated rod and cylinder assembly operatively connected at a lower end thereof to said stiffleg and operatively connected at an upper end thereof to said handle on one side of said handle pivot axis, at least one lower fluid actuated rod and cylinder assembly operatively connected at a lower end thereof to said stiffleg and operatively connected at an upper end thereof to said handle on a side opposite to the operative connection of the upper end of said upper fluid actuated assembly and said handle, relative to said handle pivot axis, and means for selectively supplying

fluid under pressure to opposite ends of said fluid actuated assemblies to effect an extension and retraction of the rods of



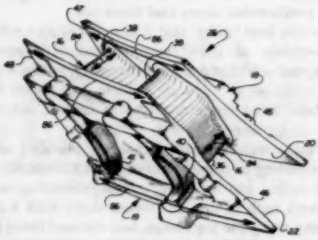
said fluid actuated assemblies to correspondingly effect a pivotal movement of said handle about said handle pivot axis.

4,464,094

TURBINE ENGINE COMPONENT AND METHOD OF MAKING THE SAME

John M. Gerken, Chagrin Falls, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed May 4, 1979, Ser. No. 36,188
Int. Cl.³ F01D *9/02*
U.S. Cl. 415—217 **43 Claims**



16. An assembly comprising a first circular shroud formed of metal, a second circular shroud coaxial with said first circular shroud and formed of metal, each of said shrouds being formed by a plurality of interconnected sections, each of said shroud sections being formed of a single crystal of metal, and an annular array of metal airfoils extending between and connected with said first and second circular shrouds, each of said airfoils having leading and trailing edges extending transversely to said first and second shrouds and an elongated columnar grain structure with grain boundaries extending generally parallel to said leading and trailing edges of the airfoils and transversely to the first and second shrouds.

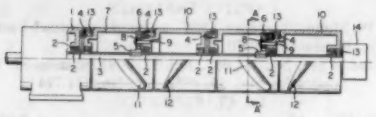
4,464,095

HYDRAULIC ENERGY CONVERTER

Kango Iida, 579, Yonezu-cho, Hamamatsu-shi, Shizuoka-ken, Japan 432

Filed Jun. 25, 1982, Ser. No. 392,170
Int. Cl.³ F03B *3/12*
U.S. Cl. 416—128 **1 Claim**

1. A hydraulic energy converter comprising one or more pinions mounted on an output shaft which is rotatably supported through bearings by a casing, and one or more turbine stages, each of which comprises a first turbine rotor with an internal gear in mesh with a plurality of planet gears and provided with blades thereon oriented in one desired direction and a second turbine rotor with said planet gears in mesh with said pinion and provided with blades thereon oriented in the other direction, mounted on said output shaft in such a way that each



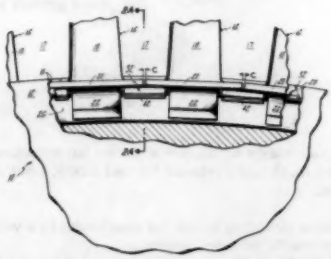
of said first turbine rotors and each of said second turbine rotors are arranged alternately and rotated in the opposite direction, respectively, so that said output shaft is rotated in a predetermined direction.

4,464,096

SELF-ACTUATING ROTOR SEAL

Edmund D. Trousdell, and Peter E. Voyer, both of Tolland, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 1, 1979, Ser. No. 90,189
Int. Cl.³ F01D *5/30*
U.S. Cl. 416—215 **8 Claims**



1. In a rotor disk of the type having a rim adapted by a circumferentially extending slot to receive the roots of a plurality of outwardly extending platform-type rotor blades wherein the slot is bounded by an upstream sidewall and a downstream sidewall, the improvement which comprises:

a rim seal disposed between the blade platforms and the rotor disk, the rim seal being spaced axially from at least one sidewall leaving a gap therebetween, the seal having an upstream strip which extends circumferentially beneath adjacent blade platforms at the upstream sidewall,

a downstream strip which extends circumferentially beneath adjacent blade platforms at the downstream sidewall,

at least two circumferentially spaced crossbars extending axially beneath adjacent platforms between the upstream and downstream strips of the rim seal;

wherein the rim seal is adapted to press against the upstream and downstream sidewalls of said disk and outwardly against the blade platforms in operative response to rotational forces.

4,464,097

TURBOMACHINERY ROTOR AND METHOD OF MANUFACTURE

Frederick E. Schultz, Devon, Pa., assignor to General Electric Company, Philadelphia, Pa.

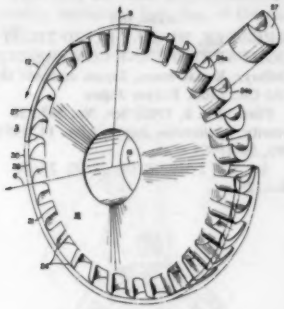
Filed Apr. 1, 1982, Ser. No. 364,211
Int. Cl.³ F01D *5/28*
U.S. Cl. 416—230 **5 Claims**

5. A turbomachinery rotor comprising a multi-stranded network of fibers having high tensile strength at high tempera-

ture contained in and bonded by a matrix, said fibers and said matrix consisting of the same material respectively and being selected from the group consisting of carbon, quartz and alumina, said rotor including:

(a) a disc portion wherein the fibers extend substantially in radial, axial, and circumferential directions;

(b) a plurality of blade portions extending radially from the outer periphery of said disc portion; and



(c) a shroud portion extending circumferentially about and interconnecting the outermost ends of said blade portions, the fibers of said shroud portion extending in radial, axial and circumferential directions, substantially all of said radial fibers in said disc portion extending beyond said outer periphery into said blade portions and further into said shroud portion.

4,464,098

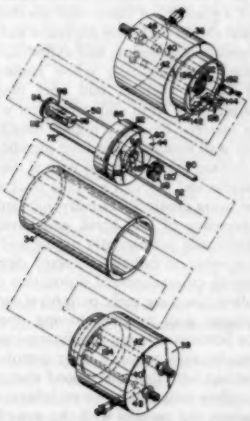
INJECTION PUMP

John T. Olson, Edina, Minn., assignor to Economics Laboratory, St. Paul, Minn.

Filed Sep. 13, 1982, Ser. No. 416,872

Int. Cl.³ F04B *9/10*

U.S. Cl. 417—397 **10 Claims**



1. An apparatus for driving a plunger of an injector pump, which plunger reciprocates to effect transfer of a liquid from a reservoir to a location at which the liquid is to be injected, comprising:

(a) a housing defining a chamber;

(b) a piston connected to the plunger and disposed within said chamber for free reciprocation therein along an axis oriented in a direction in which the plunger reciprocates, said piston having first and second surfaces facing oppositively along said axis and defining therein:

(i) a circular aperature extending through said piston axially to define a circularly cylindrical wall;

(ii) an inlet passageway having an entrance at a surface of said piston and an exit at said wall;

(iii) an outlet passageway having an entrance at said wall and an exit at a surface of said piston;

(iv) a first channel providing fluid communication between said first surface and a first port in said wall; and

(v) a second channel providing fluid communication between said second surface and a second port in said wall;

(c) an inlet conduit attached at said entrance of said inlet passageway through which conduit a fluid is pumped to said piston;

(d) an outlet conduit attached at said exit of said outlet passageway, through which conduit fluid exits said piston;

(e) a valve member including an axially extending baffle and being rotatably disposed in said circular aperture for movement between a first position wherein said exit of said inlet passageway and said first port are in fluid communication on one side thereof and said entrance of said outlet passageway and said second port are in fluid communication on an opposite side thereof, and a second position wherein said exit of said inlet passageway and said second port are in fluid communication on one side thereof and said entrance of said outlet passageway and said first port are in fluid communication on an opposite side thereof; and

(f) means for rotating said valve member from its first to its second position as said piston approaches one end of said chamber and from its second to its first position as said piston approaches and opposite end of said chamber.

4,464,099

FUEL INJECTION PUMPING APPARATUS

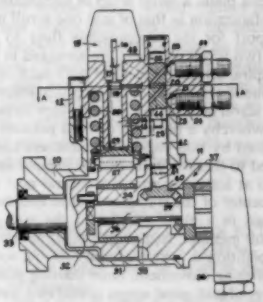
Dorian F. Mowbray, Burnham, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Jul. 8, 1982, Ser. No. 396,325

Claims priority, application United Kingdom, Jul. 9, 1981, 8121230

Int. Cl.³ F04B *7/00*; F02M *41/06*; F16H *25/14*

U.S. Cl. 417—510 **6 Claims**



1. A fuel injection pumping apparatus for supplying fuel to a compression ignition engine comprising a pump inlet, a plunger slidable within a bore, an outlet for high pressure fuel from said bore, a cam shaft rotatably mounted within a housing of the apparatus formed in at least a first housing part defining an opening and a second housing part closing said opening, and a tappet assembly including a roller engageable with a cam on the cam shaft to effect inward movement of the plunger against the action of resilient means, said cam shaft comprising a cup-shaped part having a cam profile on the exterior surface of a

skirt portion thereof, said first housing part having a hollow interior to accommodate said cup-shaped part, a bearing surface defined by the internal peripheral surface of the skirt portion, a drive shaft integral with said cup-shaped part supported in said first housing part, a hollow spigot member defined by said second housing part, said spigot member providing support for said cup-shaped part, an auxiliary drive shaft located in said spigot, a low pressure fuel pump mounted in the second housing part, one end of said auxiliary drive shaft being connected to a rotary part of the low pressure pump, and coupling means connecting the other end of the auxiliary drive shaft to said cup-shaped part.

4,464,100

SCROLL FLUID APPARATUS HANDLING COMPRESSIBLE FLUID

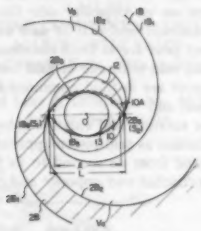
Shigeru Machida, Ibaraki; Kenji Tojo, Shimizu; Masato Ikegawa, Ibaraki, and Masao Shiibayashi, Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 24, 1982, Ser. No. 391,978

Claims priority, application Japan, Jun. 24, 1981, 56-96644

Int. Cl.³ F04C *18/02*

U.S. Cl. 418—55 **6 Claims**



1. A scroll fluid apparatus handling a compressible fluid, the apparatus comprising an orbiting and a stationary scroll member, one of said scroll members including an end plate, and a spiral wrap located in an upstanding position on said end plate and having an inner side wall curve including a starting end portion in the form of an arc, and the other scroll member including an end plate, a spiral wrap of substantially the same shape and configuration as that of said one scroll member, and at least one port for the compressible fluid to flow therethrough, said two scroll members are arranged in such a manner that said spiral wraps are meshed with each other and one of said scroll members moves in orbiting movement relative to said the other scroll member while being kept from rotating on its own axis, whereby a plurality of fluid pockets of different pressures defined by said two scroll members can have their volumes varied to thereby compress or expand the compressible fluid, said at least one port is a central port formed in a vicinity of a center of the stationary scroll member and has a profile disposed in a plane parallel to the end plate of the stationary scroll member, said profile being set on the basis of a reference condition in which as said orbiting scroll member moves in an orbiting movement, inner starting points of ourter side wall curves of said spiral wraps of said two scroll members are brought into close proximity to or into contact with inner side wall curves of the spiral wraps of the opposite scroll members and the fluid pocket nearest the center has a volume thereof minimized for an instant, said profile of said central port is measured at a point at which said central port communicates with said fluid pocket nearest the center and is defined by a boundary line located in a region defined by two circles, a first circle of said two circles being centered at a point located on a straight line extending through positions in which the inner starting points of the spiral wraps are positioned in the reference condition and equidistantly spaced apart from said positions, said first circle having a diameter equal to a distance between said positions, a second circle of said two circles centered at the same point as said first circle and having a diameter such that the second circle is in contact with the innermost portions of the inner side wall curves of said spiral wraps in said reference condition, and said profile of said central port is substantially symmetrical about said straight line connecting the inner starting points of the spiral wraps in the reference condition.

4,464,101

SEIZURE-FREE, HIGHLY FLUID TIGHT AND LIGHTWEIGHT VANE COMPRESSOR

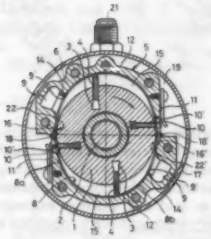
Tsunenori Shibuya, Konan-mura, Japan, assignor to T. Shibuya (Diesel Kiki Co., Ltd.), Tokyo, Japan

Filed Mar. 8, 1982, Ser. No. 355,926

Claims priority, application Japan, Mar. 14, 1981, 56-37047; Mar. 23, 1981, 56-41964

Int. Cl.³ F04C *18/00, 27/00, 29/00*

U.S. Cl. 418—125 **6 Claims**



1. A vane compressor comprising: a cylindrical peripheral wall member having an endless camming inner peripheral surface; first and second end wall members secured to opposite ends of said cylindrical peripheral wall member and defining a pump housing in cooperation therewith; a cylindrical rotor rotatably fitted within said pump housing in concentricity with said cylindrical peripheral wall member, said cylindrical rotor having an outer peripheral surface thereof formed with a plurality of axial slits; a plurality of vanes each inserted in a different one of said axial slits of said rotor for radial sliding motions therein; a liner member disposed on said cylindrical peripheral wall member along a substantially whole endless camming inner peripheral surface thereof, said liner member being formed in a separate body from said peripheral wall member and formed of a material having a higher resistance against abrasion than said wall member, said liner member having an inner peripheral surface thereof formed with at least one break extending thereacross and through a whole thickness thereof, said liner member being elastically radially outwardly unfoldable due to the presence of said break and having a whole surface thereof elastically permanently urging said cylindrical peripheral wall member in radially outward directions; and means for preventing circumferential dislocation of said liner member; said endless camming inner peripheral surface of said cylindrical peripheral wall member having opposite inner peripheral surface portions defining a minimum inner diameter thereof therebetween, said opposite inner peripheral surface portions being formed with first and second elongate recesses opening in said endless camming inner peripheral surface and extending thereacross and parallel with the axis of said rotor; said cylindrical peripheral wall member including passage means for guiding compression fluid pumped out of said pump housing into said elongate recesses; said liner member extending across said recesses over circumferential lengths thereof and being partially urgedly bent by said rotor and located in said elongate recesses, each of said recesses and said liner member cooperating to define a space therebetween; whereby said compression fluid pumped out of said pump housing is introduced into said space through said passage means to keep

said liner member and said rotor in close contact with each other.

4,464,102

EXTERNAL AXIS ROTARY PISTON COMPRESSOR

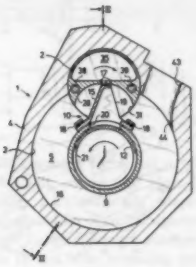
Dankwart Eiermann, Weissensberg, Fed. Rep. of Germany, assignor to Wankel GmbH, Berlin, Fed. Rep. of Germany

Filed May 28, 1982, Ser. No. 383,313

Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121269

Int. Cl.³ F04C 18/08

U.S. Cl. 418—179 18 Claims



1. An external axis rotary pistion compressor comprising:

a housing having a first and second side part, and at least two overlapping, parallel-axis, cylindrical inner chambers, each having a respective shaft passing therethrough, said housing further being provided with an outlet passage, from said inner chambers, for conveyed working gas;

a cylindrical working rotor arranged on one of said shafts, which is associated with a drive shaft journalled in said second side part, with said outlet passage in said housing essentially extending tangential to the direction of movement of said working rotor; the body of said working rotor being a hollow cylinder mounted in said first side part and rigidly and coaxially connected with said drive shaft, said hollow cylinder being provided with a hollow shutoff projection which projects radially outwardly therefrom, said hollow cylinder being further provided with a first port which communicates the hollow interior of said hollow cylinder with the hollow interior of said shutoff projection; said working rotor forming an annular working chamber with that portion of said housing which surrounds it, said working chamber, when viewed in the direction of rotation of said working rotor, including a suction chamber behind said shutoff projection, with said shutoff projection being provided on its rear side with an inlet opening, into said suction chamber, for working gas;

a cylindrical shutoff rotor arranged on the other of said shafts, which turns in the opposite direction to the one of said shafts, said shutoff rotor running along the associated portion of said housing, and riding on said working rotor; said shutoff rotor being provided with a recess for passage of said shutoff projection therethrough without contacting said shutoff rotor; and

a stationary sleeve fixed to said first side part and arranged in said hollow cylinder in such a way as to be sealingly surrounded thereby, said sleeve being provided with a second port which is adapted to coincide with said first port of said hollow cylinder when the latter rotates, said sleeve having an inner chamber which forms an inlet passage for drawn-in working gas, said first side part including an outer flange in which an inner bearing is mounted, said hollow cylinder being journalled in said inner bearing; said outer flange being provided with a central opening, and a plurality of lateral openings surrounding this central opening, for drawn-in working gas, said lateral openings being separated by said inner bearing and webs which support said sleeve; in which said hollow cylinder is provided with openings; and in which an annular chamber which surrounds said inner bearing is formed in said first side part, said lateral openings communicating with said openings, and thus with the hollow interior of said hollow cylinder, by means of said annular chamber.

4,464,103

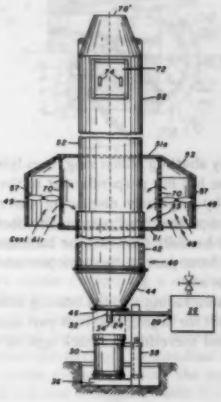
APPARATUS FOR THE PRODUCTION OF ATOMIZED METAL PARTICLES

Robert A. Ramser; A. Daivd Booz, both of New Kensington; Daniel R. Barch, Natrona Heights, and Walter S. Cebulak, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 31, 1982, Ser. No. 413,514

Int. Cl.³ B01J 2/04

U.S. Cl. 425—7 8 Claims



1. Apparatus for the production of atomized metal comprising a containment vessel having a sidewall terminating in a bottom plate through which atomizing gas and molten metal from a molten metal source external to said vessel enter said vessel through nozzle means sealed thereto and capable of converting said molten metal into metal particles, an air ingress port in said sidewall for admitting cool air into said vessel to cool said metal particles, said sidewall and bottom plate cooperating with said nozzle means to seal off the interior of said vessel and the metal particles therein from an area adjacent said external source of molten metal, thereby providing an essentially closed vessel, particularly with respect to said area adjacent said external source of molten metal.

4,464,104

ADJUSTABLE RING NOZZLE FOR EXTRUDING SYNTHETIC-RESIN TUBING

Detlef Gneuss, Am hohen Ufer 2a, D-4970 Bad Oeynhausen, Fed. Rep. of Germany

Filed Sep. 9, 1982, Ser. No. 416,223

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1981, 3138356; May 3, 1982, 3216377

Int. Cl.³ B29F 3/04

U.S. Cl. 425—192 R 12 Claims

1. A ring nozzle for use with an extruder to continuously form a synthetic-resin tube, the ring nozzle comprising:

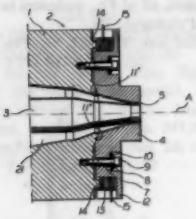
a substantially stationary back nozzle part having an axially forwardly directed front face and formed with an axially centered passage opening at the face;

an axially centered core rod substantially fixed in the passage and extending axially forward past the front face;

an annular and movable front nozzle part fitted spacedly

around the core rod forward of the front face and forming therewith an axially centered and forwardly open annular gap, the front part having a back face axially confronting the front face of the back part, the front and back faces being formed around the passage and centered on the axis with complementary part-spherical surfaces riding on each other and permitting the front nozzle part to tip limitedly on the back nozzle part and thereby vary the radial dimensions of the gap;

adjustment means including axially centered rings axially engaged between the front and back faces and having



flatly axially abutting planar ring faces lying in a plane that is transverse but not perpendicular to the axis of the nozzle, whereby angularly displacing the rings relative to each other tips the front part on the back part, the rings being braced axially between the back and front faces for tipping the front part on the back part and thereby adjusting the gap; and

biasing means including springs bearing axially back against the front part for urging the front part axially back against the rings and therethrough back against the back nozzle part.

4,464,105

DEVICE FOR THE FINAL ELONGATION OF PIECES OF DOUGH TO A LONG LENGTH

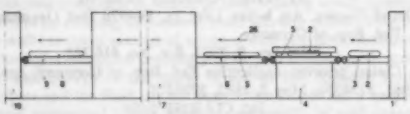
Rene Voegtlin, Schirmeck, France, assignor to Mecatherm, France

Filed Feb. 10, 1983, Ser. No. 465,506

Claims priority, application France, Feb. 10, 1982, 82 02283; Nov. 12, 1982, 82 19111

Int. Cl.³ A21C *3/02, 11/00*

U.S. Cl. 425—364 R **16 Claims**



1. Apparatus for elongating plural dough pieces at a time, comprising: an intermittantly movable but (13) which is stationary during elongation of the dough, a box for rolling said dough and means to reciprocate said box transversely of said belt while said box rests upon a row of pieces of dough to be elongated, the direction of reciprocation being perpendicular to the longitudinal axis of said dough pieces.

4,464,106

APPARATUS FOR THE PRODUCTION OF A BLANK FOR CONTAINERS

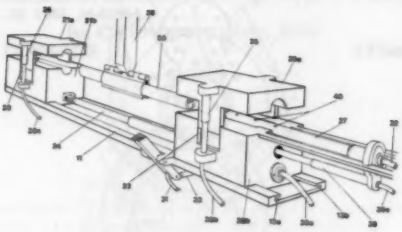
Kjell M. Jakobsen, Skanör, and Claes T. Nilsson, Löddeköpinge, both of Sweden, assignors to PLM Aktiebolag, Malmo, Sweden

Division of Ser. No. 154,888, May 30, 1980, Pat. No. 4,380,525. This application Sep. 27, 1982, Ser. No. 424,271

Claims priority, application Sweden, Jun. 11, 1979, 7905043

Int. Cl.³ B29C *17/07*

U.S. Cl. 425—525 **9 Claims**



1. Apparatus for the manufacture of a tubular pre-molding having an oriented region for a mouth part of a finished container and an amorphous region for a body part of the finished container, said apparatus comprising:

first and second spaced clamping means for clamping a tubular parison of thermoplastic material in axially spaced regions to leave a central section of said parison between the clamping means,

means for relatively axially displacing said first and second clamping means to stretch the parison in the central section between the clamped regions,

means for maintaining the diameter of the parison in said central section during stretching of the material such that the material undergoes axial orientation in said central section while its diameter is maintained,

said first and second clamping means having surfaces for engaging the parison configured so that while the central section is being stretched the material in the clamped regions retains its original thickness and amorphous state,

a mold surrounding said central section,

said mold including a portion shaped to form a mouth part of a finished container,

means for heating the material in said central section to a temperature above the glass transition temperature,

means for expanding the thus heated material in said central section into contact with the mold to form said mouth part of the finished container from the axially oriented material,

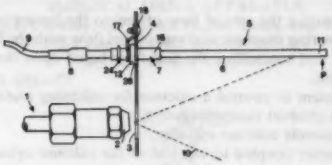
means for separating said mouth part together with the amorphous material in one of said clamped regions from the clamping means and mold,

the construction and arrangement of the clamping means and the displacement thereof to form the stretched region of the parison being such that the amorphous material not axially oriented by the stretching of the parison is of a length sufficient for reforming into the body part of the finished container.

4,464,107
ELECTRODE ARRANGEMENT FOR AN OIL OR GAS BURNER

Ove S. Boe, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Oct. 3, 1983, Ser. No. 538,113
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1982, 3239673
Int. Cl.³ F23Q 3/00
U.S. Cl. 431—264 3 Claims

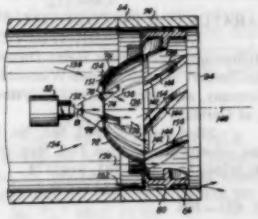


1. An electrode assembly for an oil or gas burner, comprising, a vertical housing supporting plate having a hole of a predetermined size, a cylindrically shaped fitting having a diameter somewhat smaller than the diameter of said hole and a centrally located flange having a diameter somewhat larger than the diameter of said hole, retaining spring means attached to said supporting plate and biasingly engaging said flange against said supporting plate, said fitting having a central bore, an electrode rod disposed in said bore, and clamping spring means securing said rod in said fitting bore.

4,464,108
COMBUSTION APPARATUS

Donald Korenyi, 25 John St., Lynbrook, N.Y. 11563

Continuation-in-part of Ser. No. 208,887, Nov. 21, 1980, abandoned. This application Aug. 16, 1983, Ser. No. 523,810
Int. Cl.³ F23Q 3/00
U.S. Cl. 431—265 18 Claims



1. Combustion apparatus including ignition means, a source of pressurized air, and a source of pressurized atomized fuel, said apparatus comprising:

a flame retention head forming a cylindrical combustion chamber having an upstream end and a downstream end and a longitudinal axis extending between said upstream and downstream ends,

first passage means including first deflector means for passing a first portion of said pressurized air and said pressurized fuel into said upstream end of said combustion chamber, said first deflector means being for directing said air and said fuel in a first rotational direction into a fuel/air mixture of helical configuration adopted to being ignited into a primary flame vortex about said longitudinal axis,

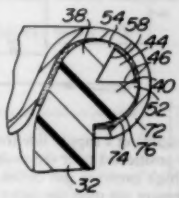
second deflector means mounted about the inner surface of said combustion chamber downstream of said first deflector means, said second deflector means being for shearing away the outer portions of said primary flame vortex and directing said outer portions into a plurality of secondary flame vortexes of helical configurations directed in second rotational directions opposed to said first rotational direction and disposed about said primary flame vortex, and

second passage means formed in said flame retention head disposed in association with said second deflector means and being for passing a second portion of said pressurized air into said combustion chamber into mixture with said plurality of said secondary flame vortexes.

4,464,109
CAPPED PLASTIC CONTAINER

Clayton Giangiulio, and Dominic D'Ambro, both of Malvern, Pa., assignors to Le-Jo Enterprises, Inc., Malvern, Pa.

Filed Mar. 10, 1982, Ser. No. 356,878
Int. Cl.³ F23D 3/18; B65D 8/18
U.S. Cl. 431—344 17 Claims



1. A container for holding a fluid therein and comprising a hollow body formed of a plastic material and having a mouth and metal closure means secured to said mouth in a fluid-tight seal, said closure means comprising a cap having a circular profile and a rolled lip extending about the periphery thereof and terminating in a free edge, said lip having an underside surface, gasket means located on said underside surface, said mouth being tubular and having a longitudinal axis, said mouth including bead means extending about the periphery of said mouth about said axis and contiguous with the free end of said mouth, said bead means including an arcuate outer surface including an annular recess extending about the periphery of said mouth and forming a pair of generally pointed corners adjacent said arcuate outer surface, each of said corners being directed outwardly away from the longitudinal axis of said container and spaced from each other in the longitudinal direction, said bead means being located within said rolled lip, with said lip being bent tightly thereabout and with the free edge disposed under said bead means, whereupon said corners tightly engage and dig into said gasket means along longitudinally spaced lines to form a fluid-tight seal between said body and said cap.

13. The method of sealing the mouth of a plastic container with a metal closure, said container having a tubular mouth having a longitudinal axis and including bead means extending about the periphery of the mouth contiguous with the free end thereof, said bead means including an arcuate outer surface including an annular recess extending about the periphery of said mouth and forming a pair of generally pointed corners extending about the periphery of said bead means adjacent said arcuate outer surface, each of said corners being directed outwardly away from the longitudinal axis of said container and spaced from each other in the longitudinal direction, said closure means including cap means, circular in profile, and having a roller lip extending about the periphery thereof and terminating in a free edge, said lip having an underside surface upon which gasket means is disposed, said method comprising the steps of disposing said cap means on said mouth and with said bead means located within said lip, disposing lip deforming means over said lip, constricting said lip deforming means in a radial direction to deform said lip around said bead means and causing both of said corners of said bead means to engage and dig into said gasket means along respective longitudinally spaced lines to form a fluid-tight seal between said cap means and said container.

4,464,110

FLARE USING A COANDA DIRECTOR SURFACE

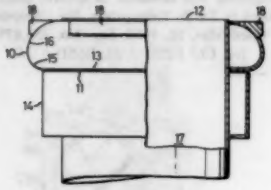
John C. Boden, Epsom, and Gerald Pratley, Hampton, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Dec. 1, 1981, Ser. No. 326,286

Claims priority, application United Kingdom, Dec. 10, 1980, 8039514

Int. Cl.³ F23D *15/04*

U.S. Cl. 431—350 **8 Claims**



1. A flare comprising a supply line for a pressurized gas and a Coanda body positioned over the outlet of the supply line so as to define a high pressure gas outlet adapted to direct the issuing high pressure gas over the outer surface of the Coanda body, means forming a low pressure gas passageway extending through the Coanda body and having an outlet at the upper end of the Coanda body, the issuing high pressure gas entraining surrounding air and being directed towards the outlet of the low pressure gas passageway, the Coanda body having a high pressure gas flow modifying means including discontinuous spaced projections on its outer surface and downstream from the high pressure gas outlet.

4,464,111

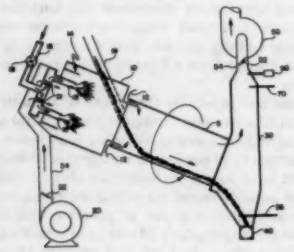
SYSTEM AND PROCESS FOR CONTROLLING A CALCINER

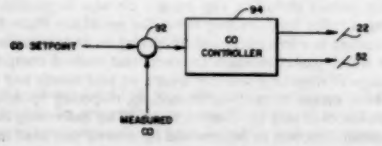
Laxmi K. Rastogi, San Jose, Calif., and Scot W. Sussman, Aurora, Colo., assignors to Measurex Corporation, Cupertino, Calif.

Filed Oct. 20, 1982, Ser. No. 435,387

Int. Cl.³ F27B *7/20*

U.S. Cl. 432—24 **9 Claims**





1. A process for controlling a calciner system for calcining a material to produce a product, the system including a burner to supply heat to the material, a rotatable calciner cylinder to contain the material and a duct to convey flue gas from the calciner cylinder, the process comprising:

(a) measuring the temperature of the product discharged from the cylinder;

(b) comparing the measured temperature of the product to a product temperature set point to determine a flue gas set point;

(c) measuring the temperature of the flue gas;

(d) comparing the measured temperature of the flue gas with the flue gas temperature set point to determine a fuel set point;

(e) measuring the rate of flow of fuel to the burner; and

(f) comparing the measured rate of fuel flow with the fuel set point and controlling the fuel flow based upon the comparison.

6. A system to control a calciner for calcining material to produce a product comprising:

(a) a rotatable calciner cylinder;

(b) a burner coupled to one end of the calciner cylinder to produce hot gas;

(c) means to introduce the material into the cylinder near the burner so that the material and hot gas flow co-currently through the cylinder;

(d) an exhaust duct to remove flue gas from the cylinder;

(e) means to measure the temperature of the product discharged from the cylinder;

(f) means to compare the measured temperature of the product to a product temperature set point to generate a flue gas set point;

(g) means to measure the temperature of the flue gas;

(h) means to compare the measured temperature of the flue gas with the flue gas temperature set point to determine a fuel set point;

(i) means to measure the rate of flow of fuel to the burner; and

(j) means to compare the measured rate of fuel flow with the fuel set point and to control the fuel flow based upon the comparison.

4,464,112

APPARATUS FOR INTRODUCING FINE MATERIAL INTO A COMBUSTION ZONE

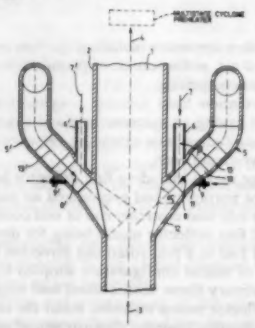
Otto Heinemann, Ennigerloh; Heinz-Dieter Baldus, Ahlen, and Heinz-Herbert Schmits, Rheda-Wiedenbrück, all of Fed. Rep. of Germany, assignors to Krupp Polysius AG, Beckum, Fed. Rep. of Germany

Filed Aug. 30, 1982, Ser. No. 412,705

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136766; Nov. 30, 1981, 3147374

Int. Cl.³ F27B *7/02*

U.S. Cl. 432—106 **21 Claims**



1. In apparatus for heat treating fine-grained material having a conduit defining a combustion zone, at least one air duct in communication with said conduit adjacent said combustion

zone, and a material supply duct in communication with said air duct at a region external of said conduit for delivering such material to said air duct, the improvement wherein said air duct has a constriction in cross-sectional area at said region to produce at said region an increase in the rate of air flow, said constriction having an inlet end and an outlet end, said outlet end communicating with said combustion zone via a divergent diffuser fixed to said conduit.

4,464,113

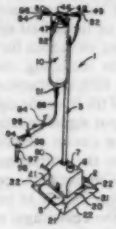
SURGICAL DRILL APPARATUS

Richard J. Parmley, 4272 Flora Pl., St. Louis, Mo. 63110

Filed Jun. 10, 1982, Ser. No. 387,247

Int. Cl.³ A61G 1/14, 15/00

U.S. Cl. 433—77 **15 Claims**



1. In an operating room in which dental surgery is performed on a patient on an operating table, portable surgical drill apparatus comprising a support including a stable base and an elongated, substantially vertical member, a sterilizable water tank, manually mountable on and demountable from said vertical member near the upper end thereof, the upper end of said tank when the tank is mounted on the support being substantially as high as the operating table, an oxygen fitting on said tank communicating with the interior of said tank, an oxygen line connected to said fitting to pressurize water in said tank, a rotary turbine drill connected to said oxygen line, a water tube communicating from the tank to the drill and a manipulable oxygen flow-controlling valve connected to said oxygen line and to a source of said oxygen under pressure.

4,464,114

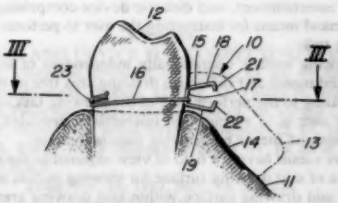
SURGICAL PACK RETENTION DEVICE

Albert J. Anthony, 45 Central St., W. Boylston, Mass. 01583

Continuation of Ser. No. 291,445, Aug. 10, 1981, abandoned. This application Jan. 17, 1983, Ser. No. 458,298

Int. Cl.³ A61C 19/06

U.S. Cl. 433—229 **4 Claims**



1. An oral pack retention system for use in covering a location in the mouth, comprising:

(a) a retention fixture adapted to be located against the side surface of a tooth, said fixture having a central portion which is adapted to lie along the side surface of the tooth and a pair of spaced arms extending away from the central portion and terminating in free ends which define an opening which is spaced from said central portion and said tooth surface,

(b) a flexible wire adapted to extend tightly around the tooth and to be fastened to the central portion of the fixture, and

(c) a mass of moldable pack material molded to the fixture so that it covers said location and engulfs said fixture, so that said fixture is effectively anchored within said mass.

4,464,115

PULSED LASER RANGE FINDER TRAINING OR TEST DEVICE

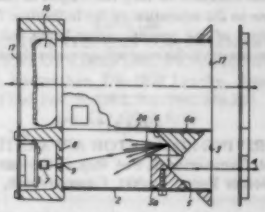
Anthony Simpson, Godalming; Stuart M. Peterkin, Effingham, and Brian T. Brooksby, Eastleigh, all of England, assignors to Detras Training Aids Limited, Alresford, England

Filed Dec. 22, 1982, Ser. No. 452,056

Claims priority, application United Kingdom, Dec. 23, 1981, 8138807

Int. Cl.³ G09B 9/00

U.S. Cl. 434—27 **16 Claims**



1. A training test device for a pulsed laser range finder having a reflected laser beam radiation receiver and an associated range distance indicator, which device includes a pulsed laser light trap having a housing attachable over an output aperture of the laser to receive and dissipate safely a beam of radiation therefrom without emission of an eye damaging amount of radiation, means in the housing for receiving an incident laser beam from the range finder, when fired, and for dissipating the received laser beam, at least one detector operable to register the presence of the laser beam in the housing and provide a corresponding output signal, a timer for receiving the output signal from the at least one detector and imparting a delay period to the output signal corresponding to the time normally taken for the laser beam to reach an object at a predetermined range and return therefrom, a source of a simulated return signal operable in response to the delayed output signal received from the timer to provide a simulated reflected laser beam return signal, and means for feeding the simulated return signal to the reflected laser beam radiation receiver for consequent operation of the associated range distance indicator.

4,464,116

HELICOPTER FLIGHT TRAINING DEVICE

Richard J. Schoolcraft, Houston, Tex., assignor to Helicopter Training Systems, Inc., Houston, Tex.

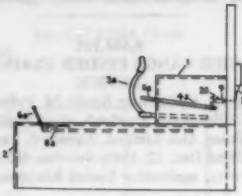
Filed Dec. 27, 1982, Ser. No. 453,497

Int. Cl.³ G09B 9/08; A63H 27/12

U.S. Cl. 434—33 **5 Claims**

1. A helicopter pilot trainer comprising, in combination, (1) a free-flying, scale model of a helicopter having its flight controls operated and controlled by means responsive to radio signals transmitted from a remote flight station to a radio receiver in said helicopter, and (2) a flight station comprising a substantially actual size simulation of a helicopter cockpit with its associated individual flight controls, and means responsive to the operation of the flight controls at the flight station for converting said operation into a radio signal transmitted to the radio receiver in said scale model helicopter to effect an operation of the flight controls in the scale model helicopter corre-

sponding to the operation of the controls at the flight station, said means responsive to the operation of the flight controls at the flight station comprising an electro-mechanical interface associated with each flight control and physically separated from said radio transmitter, the electro-mechanical interface providing an adjustable mechanical linkage between the particular individual flight control and a potentiometer in said electro-mechanical interface to vary the output of the potentiometer in response to the operation of the individual flight control, with the output of the potentiometer being fed to the radio transmitter to transmit the controlling radio signal to the radio receiver.



4,464,117

DRIVING SIMULATOR APPARATUS

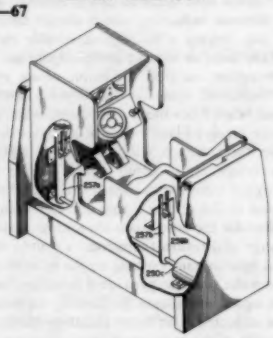
Reiner Foerst, Gummersbach, Fed. Rep. of Germany, assignor to Dr. Ing. Reiner Foerst GmbH, Gummersbach, Fed. Rep. of Germany

Filed Aug. 26, 1981, Ser. No. 296,488

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 3032250

Int. Cl.³ G09B *9/04*

U.S. Cl. 434—67 **1 Claim**



1. An apparatus for simulation of a vehicle ride along a curved portion of a road, wherein the apparatus utilizes a viewing screen for displaying a picture of the road in perspective as observed by the driver as well as utilizing a program for the generation of the road picture and using manual controls including an accelerator pedal, brake pedal, clutch pedal and gear shift lever, and a measurement device to influence the picture of the road; the apparatus further including devices for producing a speed signal, a rotational signal, a longitudinal acceleration signal and a signal indicative of centrifugal acceleration, the apparatus in combination comprising:

a supporting frame;

a cab having first and second ends and a longitudinal axis extending above the center of gravity of the cab, the viewing screen for displaying the road picture and the manual controls being located at the first end of the cab and a seat with a tiltable back, bottom and elastic bottom supports being located at the second end of the cab, in which seat the driver sits when viewing the screen and operating the manual controls;

swivel means for mounting the cab in the supporting frame for tilting about the longitudinal axis;

a gear motor positioned beneath the cab and having a shaft extending beneath the cab parallel to the longitudinal axis thereof, the shaft having a first vertical fork receiving a pin on the cab adjacent to the first end thereof and a second vertical fork receiving a pin on the cab adjacent the second end thereof, wherein as the motor rotates the shaft, the cab tilts to simulate centrifugal force on the cab;

means connected to the controls for providing an output signal indicative of the centrifugal force to be simulated on the cab by a desired angle or tilt of the cab;

means connected to the cab for measuring the angle of tilt of the cab, which angle is indicative of the centrifugal force simulated on the cab, the measuring means having an output indicative of the actual angle of tilt;

control means having an output for driving the gear motor, the control means including means for measuring the output thereof; a first subtraction circuit for subtracting the actual angle of tilt from the desired angle of tilt and for providing an output signal indicative of the difference; a second subtraction circuit connected to the first subtraction circuit and to the output measuring means for subtracting the actual output of the control from the output of the first subtraction circuit to provide an output which compensates for the centrifugal mass of the electric gear motor; and a power amplifier connected to the output of the second subtracting circuit and to the gear motor to amplify the output of the second subtracting circuit for driving the gear motor;

an additional power drive disposed between the tiltable back of the seat and cab for tilting the back toward the viewing screen to simulate acceleration and for tilting the back away from the screen to simulate braking;

means for connecting the additional power drive to the accelerator and brake controls;

a vibrator disposed between the cab and bottom of the seat for simulating engine vibrations, and

means for connecting the vibrator to the accelerator for increasing the intensity of the vibrations as the accelerator is depressed.

4,464,118

DIDACTIC DEVICE TO IMPROVE PENMANSHIP AND DRAWING SKILLS

Warner C. Scott, and Richard H. Wiggins, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 19, 1980, Ser. No. 160,879

Int. Cl.³ G09B *11/00*

U.S. Cl. 434—85 **24 Claims**

1. A didactic device for providing a learning experience and/or entertainment, said didactic device comprising:

command means for instructing the user to perform a drawing task;

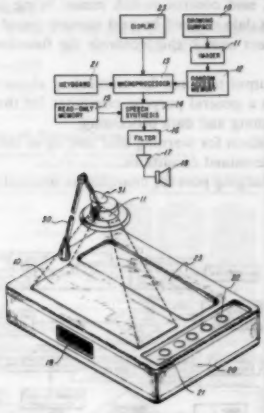
a drawing surface operationally independent of said command means and defining a drawing area free of markings relating to the performance of the drawing task on which the user is to execute the instructions provided by said command means by drawing indicia thereon;

imager means having a field of view exposed to the drawing area of said drawing surface for viewing indicia as drawn on said drawing surface within said drawing area by the user in response to instructions from said command means and providing a signal data output indicative of the appearance of the indicia;

memory means connected to the output of said imager means for receiving the signal data output therefrom and arranging the signal data output in a matrix array of signals;

data processor means having memory storage means providing data signatures of at least a plurality of indicia configu-

rations, said processor means being connected to the output of said memory means and including examination instructions for comparing the matrix array of signals provided by the signal data output of said imager means with the data signatures of said memory storage means so as to provide an analytical signal output determinative of the comparative analysis between the matrix array of signals provided by said signal data output of said imager means and the data signature of said memory storage means having the closest identity with said signal data output;



speech synthesizer means connected to the output of said data processor means for receiving the analytical signal output thereof and generating an audio signal output representative of human speech and reflective of the content of the analytical signal output from said data processor means and critiquing the quality and character of the indicia drawn by the user in relation to the particular instructions provided by said command means; and

speaker means connected to said speech synthesizer means for converting said audio signal output received therefrom to audible human speech which critically discusses the user's drawing response in relation to the instructions provided by said command means.

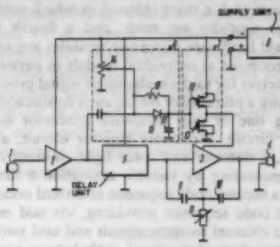
4,464,119

METHOD AND DEVICE FOR CORRECTING SPEECH

Georgy S. Vildgrube, prospekt M. Toreza, 13, kv. 47; Boris N. Kutuzov, prospekt Engelsa, 127, kv. 55; Valery N. Sokolsky, poselok Pesochny, ulitsa Leningradskaya, 70, korpus 2, kv. 8; Leon Y. Missulovin, ulitsa Korablestroitelei, 23, kv. 247, and Boris A. Kotov, ulitsa Skorokhodova, 24, kv. 16, all of Leningrad, U.S.S.R.

Filed Nov. 10, 1981, Ser. No. 320,078
Int. Cl.³ G09B *19/04*
U.S. Cl. 434—185 **3 Claims**

1. A method of correcting the speech of a person affected by stammering with the use of an audio signal transmission channel, comprising applying to the hearing organ of said person through said audio signal transmission channel his own speech delayed in time, the application of the speech being carried out in the frequency range the upper frequency limited of which is from 0.6 to 1.5 kilohertiz, and blocking said audio signal transmission channel during the pauses between the speech fragments pronounced by said person wherein said blocking per-



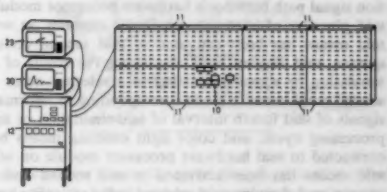
mits passage of initial fragments of the speech immediately after termination of the blocking without significant delay.

4,464,120

SIMULATOR SYSTEMS FOR INTERACTIVE SIMULATION OF COMPLEX DYNAMIC SYSTEMS

Kaj Jensen, 4, Kaerparken, DK-2800 Lyngby, Denmark

Filed Feb. 5, 1982, Ser. No. 346,240
Int. Cl.³ G09B *9/00*
U.S. Cl. 434—219 **2 Claims**



1. A modular simulator and signal processing system for interactive simulation or signal processing of dynamic systems, said modular simulator and signal processing system comprising

a plurality of basic electronic hardware processor modules including at least one module producing information signals which describe system states of a dynamic system, at least one module producing information signals which describe flow to and from a system state of a dynamic system, and at least one module responsive to input signals thereto to control said at least one module which produces system states describing information signals and said at least one module which produces flow describing information signals;

peripheral display units for providing visual displays; and

an electronic planning board having sockets in which said hardware processor modules are placeable for mounting on said electronic planning board to build a flow diagram structure model of dynamic systems to be signal processed or simulated, said electronic planning board including local bus means coupled between only neighboring sockets on said electronic planning board for transferring information signals between neighboring modules placed in said sockets on said electronic planning board, whereby the modules operate in parallel, so that the time for simulating or signal processing of models of dynamic systems is maintained constant at a predetermined maximum magnitude of approximately 10 msec independent of the size or complexity of the simulated model, and whereby the result of a simulation is displayed on said peripheral display units, and comprising a system clock for dividing the simulation or signal processing cycle of predetermined

duration into periods having a first interval in which said hardware processor modules are reset, a second interval in which said hardware processor modules simulate or signal process a model, a third interval in which said hardware processor modules are reset, and a fourth interval in which said hardware processor modules are simulated or signal processed as individual models to permit adjusting of parameters for said simulation or signal processing, and comprising a plurality of means each connected to a corresponding one of said hardware processor modules, an encoder circuit, a channel monitor circuit, a switching network, a decoder and color light emitting means, said means generating by suitable activation a first code sequence, a second code sequence or a third code sequence, said first code sequence providing, via said encoder circuit, said channel monitor circuit and said switching network, an information signal path between a hardware processor module of said plurality of hardware processor modules on which said means has been activated in said first code sequence, said display units displaying the result of said simulation or signal processing in a selected color in a first graphic curve mode corresponding to information signals of said second interval of said simulation or signal processing cycle, said color light emitting means being connected to said hardware processor module on which said means has been activated in said first code sequence, and showing said selected color via said channel monitor circuit and said decoder, said second code sequence providing, via said encoder circuit, said channel monitor circuit and said switching network, an information signal path between a hardware processor module of said plurality of hardware processor modules on which said means has been activated in said second code sequence, said display units displaying the result of said simulation or signal processing in a selected color in a second graphic curve mode corresponding to information signals of said fourth interval of said simulation or signal processing cycle, said color light emitting means being connected to said hardware processor module on which said means has been activated in said second code sequence, and showing said selected color via said channel monitor circuit and said decoder, and said third code sequence cancelling information signal output from said hardware processor module on which said means has been activated in said third code sequence.

4,464,121

DEVICE FOR MEASURING FATIGUE EFFECTS

Layne P. Perelli, 19914 Encino Ridge, San Antonio, Tex. 78259

Filed Apr. 28, 1982, Ser. No. 372,771

Int. Cl.³ G09B 7/04

U.S. Cl. 434—236 **2 Claims**

1. A device for measuring fatigue under varying workloads in a real world environment, said device having an adaptive information processing test programmed therein, said device comprising:

a case, said case having therein:

a first display, said first display providing date and time information during a testing period;

a second display, said second display consisting a symbol display and a numeric display, said symbol display presenting one of a plurality of symbols upon a computer command, said numeric display consisting of five digit displays arranged in an "X" pattern, one of said five digit displays being located on each arm of said "X" and one located at the center of said "X", each of said symbols corresponding to a number displayed in one of said digit displays as predetermined by said adaptive information processing test whereby a user of said device must know what number corresponds to each of said symbols;

a plurality of numeric input switches, said numeric input switches located on a front side of said case and positioned below said second display, said input switches having numerals printed thereon, one numeral per switch, said numerals ranging from zero to nine, numeric input switches one, two, three located in a first row, numeric input switches four, five, six located in a second row, numeric input switches seven, eight, nine located in a third row, and numeric input switch zero located in a fourth row, said first, third, fifth, seventh, and ninth numeric input switches highlighted from said other switches so as to form an "X" pattern similar to the "X" formed by said numeric display of said second display;

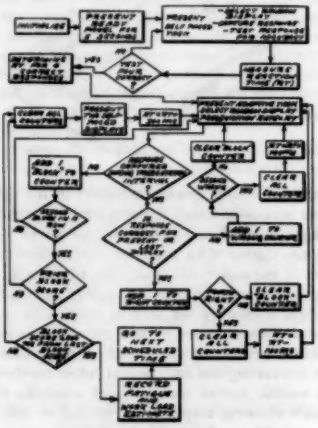
control switch means located on said front side of said case and positioned near the bottom of said numeric input switches, said control switch means being able to enter and erase data entered on said numeric input switches;

a mode select switch that controls the functioning of said device;

an input/output terminal for connecting electronically said device to a general purpose computer for the purpose of programming and data processing;

an audible alarm for warning said user upon the occurrence of predetermined conditions,

a battery charging port for charging an internal battery; and



a microcomputer, said microcomputer operably connected to said first display, said second display, said numeric input switches, said control switch means, said mode select switch, said input/output terminal, said audible alarm, and said internal battery, said microcomputer programmed with said adaptive information processing test, said microcomputer causing one of said symbols to appear in said symbol display of said second display and numbers to appear in said numeric digit display where one of said numbers corresponds to said symbol being displayed at that time, said user being required to remember the correspondence between said symbol and said number, said user noticing the position of said number in said "X" of said numeric digit display, and said user pushing a numeric input switch that corresponds with said portion of said number that corresponds with said symbol being displayed at that time, said user being required to repeatedly accomplish the above as programmed in said microcomputer, said microcomputer storing the results of each response for input to said general purpose computer; and

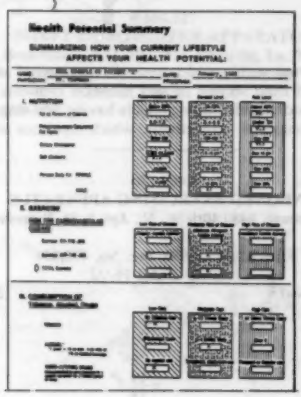
a cover, said cover having a window therein to view said first display, said cover attached to said case.

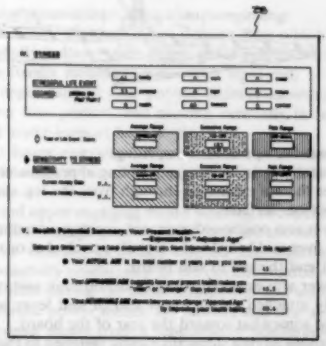
4,464,122

HEALTH POTENTIAL SUMMARY AND INCENTIVE SYSTEM

Berkeley Fuller, 1025 Wilder Ave., Honolulu, Hi. 96813; Linda Soll, 606 Hunakai St., Honolulu, Hi. 96816; Margretta Obrecht, 47-262A Hui Iwa St., Kaneohe, Hi. 96744; Gary Poole, Box 8637, PSSA, Auckland 3, New Zealand; Edward F. Campbell, Jr., 55 S. Judd St. #806, Honolulu, Hi. 96817; Margaret Parsons, 2144 Haena Dr., Honolulu, Hi. 96813; Valerie P. P. Chun, 2612A, Kapiolani Blvd., Honolulu, Hi. 96826; David R. Shearer, 2452 Tusitala, #710, Honolulu, Hi. 96815, and Thomas M. Cashman, 3130 Huelani Dr., Honolulu, Hi. 96814

Filed Dec. 2, 1982, Ser. No. 446,344
Int. Cl.³ G09B *19/00*
U.S. Cl. 434—262 14 Claims





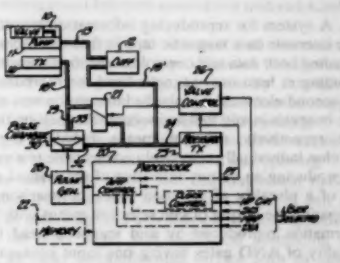
1. The method of preparing a health potential analysis for a human subject by use of imprinted material and a data bank, said method comprising establishing a plurality of categories of health related information, preparing a questionnaire comprising a set of information inquiries for each category wherein the inquiries are subject to score box responses of the character of yes, no, unanswered, or answered by a character according to a graduated scale, subjecting the questionnaire to responses by the human subject and preserving the responses thereto, storing in the data bank an inventory of health implementing commentary and recommendations, preparing a set of instructions to direct commands to the data bank wherein the instructions are keyed to the score box responses, preparing an analysis in the form of a multiple part health potential summary report having for a first part a series of preprinted recommendations respecting health practice for the respective categories and for a second part spaces to accept information, preparing a lifestyle resume document on which is depicted sets of visually accented read-out displays at visually adjacent locations for showing respectively recommended health practice, moderately exceptional health practice and high-risk health practice for said categories, and feeding commands to the data bank to effect a print-out of subject directed commentary and recommendations on respective spaces of said second part of the summary report at locations visually adjacent related preprinted recommendations.

4,464,123

ARM SIMULATOR FOR AN OSCILLOMETRIC BLOOD PRESSURE MONITOR

Wayne Glover, Odessa, and Richard Medero, Lutz, both of Fla., assignors to Critikon, Inc., Tampa, Fla.

Filed Jul. 6, 1982, Ser. No. 395,537
Int. Cl.³ G09B *23/32*
U.S. Cl. 434—268 6 Claims



1. A simulator device for simulating the pressure pulsations from a subject whose blood pressure is being determined by an oscillometric blood pressure monitor with an inflatable pressure cuff, comprising:

a. pressure chamber means with an input and an output for creating a pressure pulse at its output related to an applied electrical signal, the input being in pressure communication with the pressure cuff, and the output being in pressure communication with the monitor;

b. means for generating the applied electrical signal in the form of a series of pulses occurring at a preselected rate, the amplitudes of said pulses being adjusted in response to the pressure in the pressure cuff to simulate the pressure pulses of a test subject with selected blood pressure values;

c. a controllable pressure valve connected between the input and output of the pressure chamber, said valve normally being open; and

d. means for closing said valve for a period substantially equal to the period of said pressure pulse, so that the total pressure at the output of the pressure chamber means is the sum of the pressure pulse and the pressure applied from the pressure cuff;

e. wherein said pressure chamber means comprises

(i) a hollow housing with an input port coupled to the input of said pressure chamber and an output port coupled to the output of said pressure chamber,

(ii) a diaphragm dividing the interior of said housing between said input port and said output port, and

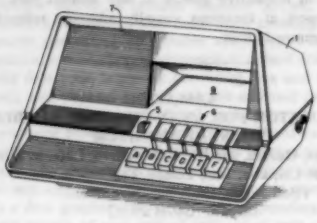
(iii) means for causing movement of said diaphragm in response to an electrical signal, the amplitude, direction and frequency of the movement being related to the amplitude, polarity and frequency of the electrical signal.

4,464,124

ELECTRICAL EDUCATIONAL DEVICE

Hugo Romero, New Rochelle, N.Y.; Avi Arad, Westport, Conn.; Dietmar Nagel, Chester, N.J., and Melvin Kennedy, New York, N.Y., assignors to North American Foreign Trading Corporation, New York, N.Y.

Filed Apr. 1, 1982, Ser. No. 365,351
Int. Cl.³ G09B *7/06*
U.S. Cl. 434—321 **20 Claims**



1. A system for reproducing information recorded at periodic intervals on a magnetic tape in first and second channels including both data and control information comprising means including at least one magnetic head for reproducing as first and second electrical signals the information recorded at periodic intervals in said first and second channels on the magnetic tape, repectively; selection means including a plurality of switches individually selectively connectable to a voltage level for producing an output indicative of the manual selection of one of a plurality of selection states; comparison means for comparing the output of said selection means with the control information reproduced by said magnetic head including a plurality of AND gates having one input connected to a respective one of said switches and means for applying said control information from said magnetic head to a second input of said AND gates; indication means for providing first or second indications in dependence on the result of said comparing by said comparison means, including an electrical transducer and control means responsive to said comparison means for applying one or the other of said first and second electrical signals to said electrical transducer in accordance with the result of said comparison; and timing means responsive to the detection of a tone at a first frequency during each periodic interval for enabling operation of said control means; wherein said control information is provided in one of said first and second channels as one or more tones at a second frequency and wherein said means for applying said control information to said AND gates includes a tone decoder connected to receive one of said first and second electrical signals and a counter having an input connected to receive the output of said tone decoder and plurality of outputs connected respectively to the second inputs of said AND gates.

4,464,125

MAGNETIC TOY CART

Theodore J. Lierl, 8440 Jonfred Ct., Cincinnati, Ohio 45231

Filed Nov. 15, 1982, Ser. No. 441,485
Int. Cl.³ G09B *1/08;* **A63H** *33/26*
U.S. Cl. 434—330 **12 Claims**

1. A toy comprising:

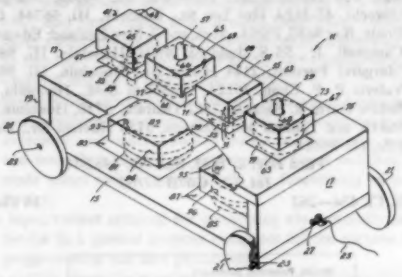
a plate formed with at least two sections each having bores extending therethrough, said sections being marked with an identifying indicia;

individual first magnets disposed in said sections of said plate;

insertion elements each including a head section connected to a stem section, each of said insertion elements being marked with an identifying indicia matching said identifying indicia of at least one of said sections;

individual second magnets disposed in said head section of each of said insertion elements;

said stem sections of said insertion elements being adapted to



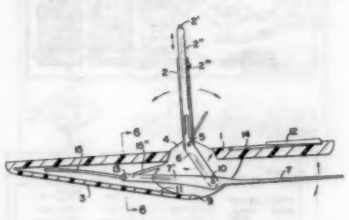
be inserted within said bores, said sections of said plate and said head section of said insertion elements marked with matching identifying indicia having first magnets and second magnets, respectively, which repel one another.

4,464,126

FINBOARD EXERCISING APPARATUS

Leo Maisonneuve, 4480 40th St., N., Apt. 1, St. Petersburg, Fla. 33714

Filed Mar. 7, 1983, S.r. No. 472,854
Int. Cl.³ B63H *16/12*
U.S. Cl. 440—15 **3 Claims**



1. An exercise apparatus comprising:

(a) a floatable board having an opening approximately in the center thereof extending through from the top surface to the bottom surface;

(b) a lever arm positioned over said opening extending vertically over said board and pivotally attached at or near the lower end thereof to said board;

(c) a lower arm extending downward through said opening, rigidly attached to the lower end of said lever arm and angled somewhat toward the rear of the board;

(d) a housing having sidewalls rigidly fastened to the underside of said board, positioned parallel to the linear axis of said board and having a hollow portion between said sidewalls therein positioned under said opening so as to accommodate the lower end of said lower arm, said sidewalls each having a groove extending from the inside of said housing a substantial depth into the thickness of said sidewall and running from the forward part of said sidewall through a substantial part of the length of said sidewall and then turning at an upward angle;

(e) a flexible fin having one end wider than the other; and

(f) a finshaft rigidly attached to the narrower end of said fin, pivotally attached to the lower end of said lower arm and also having a pin extending perpendicularly and horizontally through said finshaft near the forward end of said finshaft, said pin being of sufficient length to reach into

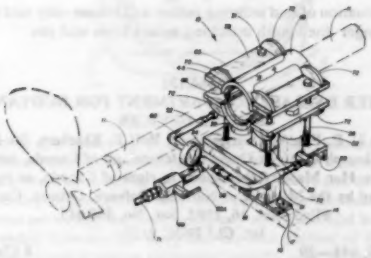
said grooves in said housing sidewalls and adapted to move forward and backward in said grooves as said finshaft moves forward and backward, the hollow portion of said housing being of appropriate size and shape to accommodate movement of said lower arm and said finshaft whereby forward and backward movement of said lever arm effects an upward and downward movement respectively of the wider end of said fin.

4,464,127

SHAFT IMMOBILIZER APPARATUS

Mark J. Boudreaux, P.O. Box 376, Chauvin, La. 70344

Filed Apr. 8, 1982, Ser. No. 366,550
Int. Cl.³ B63H *23/00*
U.S. Cl. 440—74 **4 Claims**



4. A shaft immobilizer apparatus, comprising:

a. a vertically disposed lower support base which is a substantially hollow, open-ended rectangular steel base, said base fixedly mounted on its lower most end;

b. an upper support base portion slidably mounted on said lower base portion, and moving vertically in relation to said lower support base portion;

c. first lower engaging means, movable in relation to said upper support base for engaging the shaft to be immobilized;

d. second upper engaging means working in coperation with said first engaging means, said first and second engaging means defining an axially aligned immobilizing surface substantially conforming to the circumferential surface of said shaft during the immobilization of said shaft;

e. hydraulic power means, for moving said first and second engaging means from a substantially non-immobilization position to substantially an operative immobilization position;

f. friction means mounted on the inner surfaces of said first and second engaging means, said friction means coming into frictional contact with said shaft during the immobilization of said shaft;

g. a hydraulic fluid source;

h. pressure valve means for maintaining said hydraulic fluid under pressure in order to maintain immobilization of said shaft, and for relieving hydraulic pressure establishing non-contact between said first and second engaging means and said shaft; and

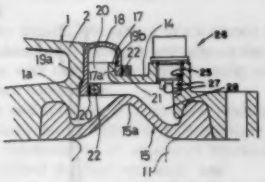
i. spaced means for establishing clearance between said lower and upper engaging means and the outer surface of said shaft during non-immobilization of said shaft.

4,464,128

SEAL ARRANGEMENT BETWEEN AN OUTDRIVE UNIT AND A HULL OF A VESSEL

Kinichi Aso, Yawata, and Kazuyoshi Shinada, Kaizuka, both of Japan, assignors to Yanmar Diesel Engine Company Ltd., Osaka, Japan

Filed Nov. 12, 1981, Ser. No. 320,691
Claims priority, application Japan, Dec. 3, 1980, 55-174043[U]
Int. Cl.³ B63H *5/12*
U.S. Cl. 440—112 **3 Claims**



1. A seal arrangement between an outdrive unit and a hull of a vessel, comprising:

an outdrive unit connectible to an engine and mounted on a bed of the hull with vibration-proof means therebetween, said outdrive unit projecting downwardly through an opening in the hull and having a circumferential stepped surface facing downwardly towards said opening;

a diaphragm seal fixed to the hull and the outdrive unit for selecting a space therebetween above said opening;

an annular seal flange above said diaphragm seal radially projecting from said bed toward said outdrive unit and having an inner edge and a cylindrical vertical upstanding end at the inner edge, said cylindrical upstanding end having an outer circumferential surface with an annula perpendicularly stepped surface at a position above said stepped surface of said outdrive unit;

a ring seal arranged between the outdrive unit and the seal flange for sealing a space therebetween above said diaphragm seal, said ring seal having a substantially inverse U-shape with a first depending leg and a second depending leg, each leg having an inner surface and an outer surface relative to a center line of the U, said first leg being longer than said second leg, said first leg having an annular stepped surface on a lower end of its outer surface engaging said circumferential stepped surface of said outdrive unit, said second leg having an annular stepped surface on a lower end of its inner surface engaging said annular perpendicularly stepped surface of said cylindrical upstanding end of said seal flange, and

separate means for fastening said legs of said ring seal to the outdrive unit and the seal flange, respectively, said means for fastening said first leg to said outdrive unit being positioned at a position below the position of said means for fastening said second leg to said seal flange, said means for fastening said first leg engaging the inner surface thereof, said means for fastening said second leg engaging said outer surface thereof.

4,464,129

SAFETY MARKER FOR DIVERS

Patrice Vancheri, and Henri Lefebvre, both of Castres, France, assignors to Societe Syselec (S.A.R.L.), Puylaurens, France

Filed Dec. 1, 1981, Ser. No. 326,377
Claims priority, application France, Dec. 1, 1980, 80 25517
Int. Cl.³ B63B *45/00*
U.S. Cl. 441—16 **3 Claims**

1. A water safety marker for divers, comprising:

(a) a float having a top and a bottom and a water line;

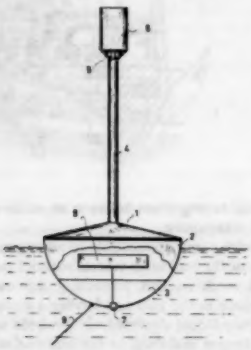
(b) a mast having a top mounted on said top of said float

projecting a substantial distance above said top of said float and above said water line;

(c) ballast in said bottom of said float for maintaining said float upright in said water and positioned below said water line;

(d) light signaling means mounted on said mast top for signaling to a surfaced object;

(e) a float light signaling means for signaling to said divers mounted in said float and having at least a portion extending below said ballast and substantially below said water line;



(f) electronic detection means mounted on said top of said mast and below said light signaling means for generating a signal when the presence of the approach of said surface object is detested;

(g) means for shaping said signal positioned in said float; and,

(h) control means associated with said signal shaping means for intermittent operation of both said mast top light signaling means and said float light signaling means when detection of a surface object occurs.

4,464,130

MULTIPLE DEPTH SELECTOR MECHANISM

Charles W. Ouellette, and David Edson, both of Portsmouth, R.I., assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 8, 1981, Ser. No. 309,622
Int. Cl.³ B63B *21/52*
U.S. Cl. 441—25 **9 Claims**

1. A device for paying out a sequence of predetermined lengths of line from a spool of line comprising:

a plurality of attaching means in contact with each other connected to said line at points corresponding to said predetermined lengths of line;

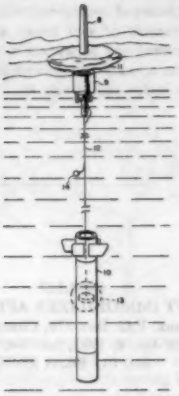
a tensioning means attached to one end of said line;

a securing means;

means for successively actuating said securing means;

said securing means comprising an electrically operated solenoid having a release pin, said pin being releasably attached to said attaching means to prevent the attaching means from being released from said securing means when said solenoid is unenergized, said pin moving in response to energization of said solenoid to allow only the attaching means attached to that portion of the predetermined length of line under tension by said tensioning means to be released by said pin;

said tensioning means causing the next longer predetermined length of line to become tensioned and to position its attaching means on said securing means such that the next



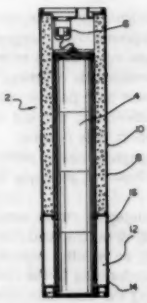
actuation of said securing means will release only said next longer line length attaching means from said pin.

4,464,131

WATER BALLAST COMPARTMENT FOR BUOYANT MARINE DEVICES

Joseph L. P. Plante, Charlesbourg; Rolf E. Kluchert, Ste-Foy, and Joseph C. M. St-Onge, Neufchatel, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Mar. 16, 1982, Ser. No. 358,617
Int. Cl.³ B63C *9/21*
U.S. Cl. 441—29 **8 Claims**



1. In an elongated buoyant marine device intended for use in a generally vertical position and carrying a pyrotechnic candle which during burning will cause a loss of weight and consequent change in center of buoyancy, including

a ballast compartment situated below the center of gravity of the marker when the marker is in said generally vertical position;

at least one water inlet port near the lower end of the ballast compartment for entry of water into said ballast compartment;

at least one air exhaust port near the upper end of the ballast compartment to permit passage of air from said ballast compartment as water enters said ballast compartment, the improvement comprising

the size of said ports being selected so that water will enter into and air will exhaust said compartment at a controlled

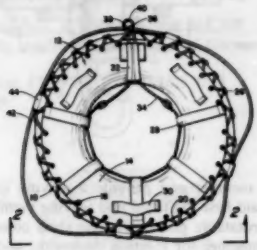
rate so that the filling of the ballast compartment by water takes place over substantially the time during which the candle burns, wherein the increase in weight of the device due to water entry into the ballast compartment will approximately offset the decrease in weight due to burning of the candle at any give time during the burning cycle, whereby the device is maintained in said generally vertical position.

4,464,132

LIFE PRESERVER

Lee E. Mauck, 8155 E 46th, Tulsa, Okla. 74145

Filed Aug. 13, 1982, Ser. No. 407,803
Int. Cl.³ B63C 9/08
U.S. Cl. 441—81 **10 Claims**



1. A life preserver comprising a buoyant toroidal body, resilient band means secured radially around at least a portion of the cross sectional circumference of the body and having the central portion thereof free with respect to the body, rope means encircling the inner periphery of the toroidal body and threaded between the body and the free portion of the band means, channel means extending radially with respect to the body to provide communication between the interior and exterior of the toroidal body, the rope means having outer ends extending slidably through the channel means and terminating exteriorly of the body, and means engagable with the outer ends of the rope means for selectively drawing the rope means radially inwardly against the force of the resilient band means for secure engagement with a victim disposed within the interior of said toroidal body.

4,464,133

METHOD OF CHARGING A VESSEL WITH MERCURY

Carl F. Buhrer, Framingham, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 5, 1982, Ser. No. 365,120
Int. Cl.³ H01J 9/395
U.S. Cl. 445—9 **3 Claims**

1. A method of charging a lamp, electronic tube or the like with mercury, the method comprised of the steps of: preparing a composition of a particulate intermetallic compound of mercury and one or more first metals selected from the group consisting of zirconium and titanium and a particulate second metal selected from the group of nickel or copper, wherein the weight ratio of said first metal to said second metal is that of an eutectic of said metals; inserting said composition into said lamp, tube or the like; sealing said lamp, tube or the like, and heating said composition to a temperature sufficient to cause said composition to reactively melt releasing mercury as a vapor flash and yielding an eutectic of said metals.

4,464,134

PROCESS FOR INDUCING PERPENDICULAR ALIGNMENT OF LIQUID CRYSTALS

Anna M. Lackner, Los Angeles; John D. Margerum, Woodland Hills, and Leroy J. Miller, Canoga Park, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 10, 1981, Ser. No. 329,452
Int. Cl.³ G02F 1/07
U.S. Cl. 445—24 **9 Claims**

1. A process for treating the surface of a substrate to induce liquid crystals subsequently brought into contact therewith to orient themselves with their directors substantially perpendicular to said surface comprising:

first providing said substrate with an oxide coating; and

then heating said coated substrate to a temperature adequate to prevent condensation of vaporized reactant alcohol molecules utilized in subsequent steps; and

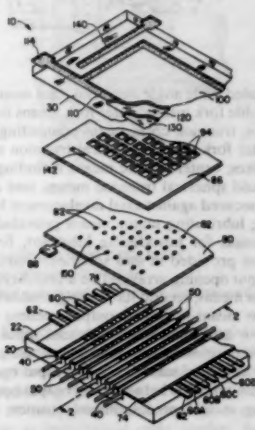
subsequently reacting said coating with alcohol molecules of the formula ROH in a vapor phase to provide an overcoated surface containing RO groups thereon, where R is an aliphatic carbon chain having from about 10 to about 24 carbon atoms therein.

4,464,135

METHOD OF MAKING A DISPLAY PANEL

Nicholas C. Andreadakis, Branchburg, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 22, 1982, Ser. No. 443,583
Int. Cl.³ H01J 9/02
U.S. Cl. 445—25 **3 Claims**



3. The method of making a display panel comprising the steps of

preparing a base plate having a top surface and an array of slots in said top surface and anode electrodes seated in said slots,

providing a thin sheet of metal,

removing portions of said body of said sheet of metal in a pattern of parallel stripes,

securing said sheet of metal to said top surface of said base plate with the unetched surface thereof up,

removing the material of said unetched surface of said metal sheet down to said etched pattern of stripes and through said pattern to form separate strips of metal of said sheet of metal on said top surface of said base plate,

said strips of metal being oriented transverse to said anode electrodes and comprising cathode electrodes,

providing a layer of insulating material in parallel strips on said metal strip cathode electrodes,

mounting an apertured plate on said layer of insulating material, the apertures having two portions, a first small diameter portion and a larger diameter portion which comprises display cells in the panel when operated,

securing a face plate to said base plate with a hermetic seal between them, said face plate carrying on its inner surface a large-area transparent conductive electrode coated with a film of glass to make the electrode an A.C. electrode which takes part in controlling the operation of said display cells, and

filling the panel with an ionizable gas suitable for providing glow in the panel.

4,464,136

LUBRICATED WIDE ANGLE UNIVERSAL JOINT

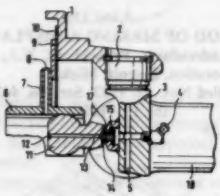
Mathias Konrad, Troisdorf, and Klaus Kümpf, Lomar, both of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 421,861

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1981, 3142930

Int. Cl.³ F16D *3/26*

U.S. Cl. 464—14 **4 Claims**



1. A lubricated wide angle universal joint assembly comprising: inner double fork means; outer fork means including a pair of outer yokes; trunnion cross means connecting together said inner and outer fork means; spherical trunnion means guiding said outer yokes; centering disc means including guide means engaged by said spherical trunnion means, said centering disc means being secured against axial displacement but being radially movable; lubricating nipple means provided in said trunnion cross means for introducing lubricant; first lubricating channel means provided in said spherical trunnion means including an input opening arranged on a side thereof facing said trunnion cross means; second lubricating channel means in said trunnion cross means having an output opening adapted to be placed in flow communication with said input opening at a predetermined position of said outer yokes; and a sealing member provided in one of said output and input openings to seal said flow communication between said output opening and said input opening at said predetermined position of said outer yokes.

4,464,137

CLUTCH MECHANISM

Richard E. Jennings, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Dec. 21, 1982, Ser. No. 452,001

Int. Cl.³ F16D *7/02, 3/14*

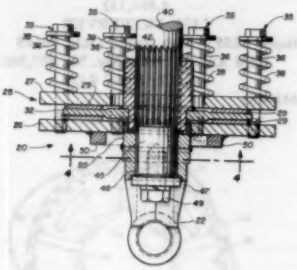
U.S. Cl. 464—48 **14 Claims**

1. A torque limiting power transfer assembly comprising:

a clutch mechanism having a driving member, a driven member operatively engageable with said driving member, and a biasing means for urging said driving member and said driven member into engagement for the transfer of rotational power therebetween, said biasing means permitting said driving and driven members to become operatively disengaged so that power is not transferred therebetween when the power to be transferred exceeds a predetermined amount;

a first rotatable power transfer shaft operatively associated with said driving member, said first shaft being rotatable relative to said driving member;

limit means connected to said driving member to limit the rotational movement of said first shaft relative to said



driving member and provide a driving connection between said first shaft and said driving member; and

a second rotatable power transfer shaft connected to said driven member for rotation therewith, said second shaft including a collar portion projecting beyond said clutch mechanism, said first shaft being mounted on said collar portion for rotation relative thereto adjacent said driving member.

4,464,138

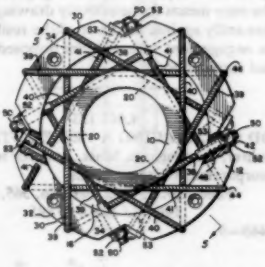
FLEXIBLE COUPLINGS

Robert W. Decker, Stewartsville, N.J., assignor to Sier-Bath Gear Company, Inc., North Bergen, N.J.

Filed Sep. 20, 1982, Ser. No. 420,122

Int. Cl.³ F16D *3/50*

U.S. Cl. 464—56 **5 Claims**



1. A flexible coupling comprising: a first rotatable member; a pair of axially spaced coaxial outer rotatable members, each outer rotatable member having at least a portion thereof of greater inside diameter than the outside diameter of the first rotatable member thereby providing an annular space between the pair of outer rotatable members and the first rotatable member, the first rotatable member having a plurality of grooves on its outside periphery adapted to change the axial location of cables extending tangentially to the first rotatable member between two circumferentially spaced locations on each outer rotatable member, each cable having one end connected to a second rotatable member and extending from the second rotatable member to a groove in the first rotatable member, then from said groove to the second rotatable mem-

ber where it is wrapped around the second rotatable member, then from the second rotatable member back to a second groove in the first rotatable member, then from the first rotatable member back to the second rotatable member where it is wrapped around said rotatable member, then from said second rotatable member to a third groove in the first rotatable member, and then from the first rotatable member to the second rotatable member where the other end of the flexible cable is connected to the second rotatable member, the two ends of the flexible cable being at substantially the same circumferential location on the second rotatable member.

4,464,139

TELESCOPIC SHAFT

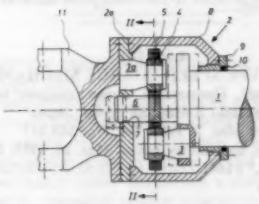
Hans Lindenthal, Heidenheim-Mergelstetten, Fed. Rep. of Germany, assignor to Voith Transmit GmbH, Fed. Rep. of Germany

Filed Nov. 4, 1981, Ser. No. 318,285

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1980, 3041528

Int. Cl.³ F16C *3/03*; F16D *3/48*

U.S. Cl. 464—69 **3 Claims**



1. A torque transmitting telescoping shaft assembly comprising: an inner shaft and a hollow shaft assembly arranged coaxially about the inner shaft to define a closed chamber therebetween, the inner shaft being telescopically received and displaceable in the axial direction relative to the hollow shaft assembly; at least two guide rods, for transmitting torque, arranged inside the chamber in a plane perpendicular to the axis of the shaft; said guide rods being movably mounted with one end connected to the inner shaft and the other end connected to the hollow shaft assembly so that the one end of a guide rod connected to the inner shaft alternates with one end of a guide rod connected to the hollow shaft assembly, seen in the direction of rotation; guide means axially telescopically guiding the inner shaft and the hollow shaft assembly relative to each other at least at two guide places; wherein the hollow shaft assembly includes a plate having an axial bore therethrough coaxially arranged about the longitudinal axis of the hollow shaft assembly; a journal coaxially arranged on the end of the inner shaft and extended through the plane of said guide rods and the bore comprising a first one of said guide places, and the inner shaft engaged to the hollow shaft assembly to define a second one of said guide places.

4,464,140

TORQUE TRANSMITTING COUPLING

Bengt Lundgren, Lerum, Sweden, assignor to SKF Mekanprodukter AB, Sweden

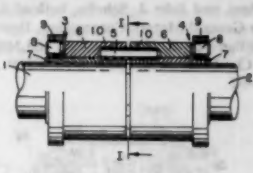
Filed Aug. 20, 1982, Ser. No. 410,048

Claims priority, application Sweden, Sep. 11, 1981, 8105410

Int. Cl.³ F16B *2/00*; F16D *3/48, 3/70*

U.S. Cl. 464—71 **1 Claim**

1. A device for transmitting torque between at least a pair of shaft members disposed in end-to-end rotation comprising a pair of inner and outer sleeve members circumscribing each shaft member and the inner and outer sleeve members having complementary confronting axial surfaces having thread means defining a saw-tooth profile, means for effecting relative axial displacement of the inner and outer sleeve members to produce a clamping action against said shaft members, means defining corresponding recesses in the confronting radial faces of said inner and outer sleeve members of each pair, a portion



of each recess being formed in the axial confronting surfaces of said inner and outer sleeve members and a peg mounted in said corresponding recesses bridging said pairs of inner and outer sleeve members to transmit torque between said pair of shaft members.

4,464,141

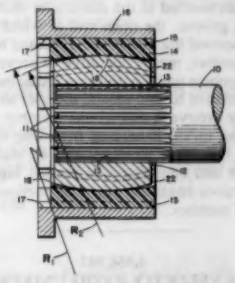
SHAFT COUPLING

Harry W. Brown, Annapolis, Md., assignor to Arinc Research Corporation, Annapolis, Md.

Filed Apr. 30, 1982, Ser. No. 373,639

Int. Cl.³ F16D *3/52*

U.S. Cl. 464—75 **13 Claims**



1. A shaft coupling system comprising:

a first shaft having a hollow end;

a hollow bushing secured within the hollow end of said first shaft;

a second shaft having means for cooperating with said hollow bushing on the end of said second shaft, said means for cooperating having a surface arcuate in longitudinal cross section and having spline teeth extending from the surface, each of said spline teeth having an outer surface part-circular in longitudinal cross section, defined by a radius substantially greater than the distance between an axis of said second shaft and the outer surface of said teeth, and having a transverse cross section defined by substantially identical first and second part-circular arcs meeting at a single common point, said first and second arcs defining first and second sides respectively of the tooth, the radius centers of said first and second arcs coinciding at the point where the surface of said means for cooperating is the greatest radial distance from the center of said second shaft and from said point of coincidence to each end of said spline teeth, the radius center radius of said first arc is closer to said second side than to said first side, and the radius center of said second arc is closer to said first side than said second side, such that said teeth are tapered from said point to each end and the radial height of the teeth is

greatest at the point of coincidence and decreases progressively from that point to each end.

4,464,142

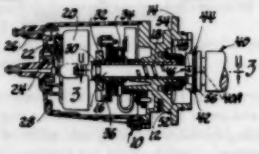
IGNITION DISTRIBUTOR SHAFT COUPLER

David B. Bridges, and John J. Schulte, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 3, 1983, Ser. No. 463,344

Int. Cl.³ F16D *3/50, 3/14, 3/78;* **F02P** *1/00*

U.S. Cl. 464—92 **6 Claims**



1. A coupling for driving the shaft of an ignition distributor from the camshaft of an internal combustion engine comprising, a first member adapted to be driven by the camshaft having first lug means extending axially from one face thereof in one direction and having second lug means extending axially in an opposite direction, the first lug means adapted to mesh with a groove formed in the end of the camshaft, the longitudinal axis of said first lug means being perpendicular to the longitudinal axis of said second lug means, a second driven member adapted to be connected to the distributor shaft having a radially extending groove, the open end of which faces said first member, said second lug means being located in said groove in said second member, means operative to prevent axial separation of said members while permitting radial movement of said first member relative to said second member along the longitudinal axis of the groove in said second member, said last named means including means extending from one of said members and engaging the other member, and an elastomeric sleeve disposed about and engaging said second lug means having outer wall portions engaging side wall portions of the groove in said second member.

4,464,143

CONSTANT VELOCITY RATIO UNIVERSAL JOINT

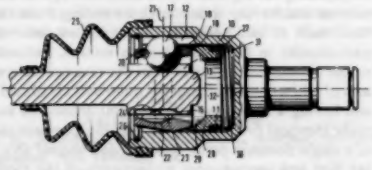
John T. Bowyer, Birmingham, England, assignor to Hardy Spicer Limited, Birmingham, England

Filed Sep. 25, 1981, Ser. No. 305,461

Claims priority, application United Kingdom, Oct. 3, 1980, 8031995

Int. Cl.³ F16D *3/30*

U.S. Cl. 464—146 **4 Claims**



1. A constant velocity ratio universal joint comprising a hollow outer joint member with a cylindrical internal surface having longitudinally extending grooves therein, an inner joint member disposed within the outer joint member and having longitudinally extending grooves opposing those in the outer joint member, a plurality of balls disposed one in each opposing pair of grooves for torque transmission between said members and movable along said grooves to permit relative angular and axial movement between said members, and an annular cage disposed between the inner and outer joint members and having apertures in which said balls are received, said cage having a part-spherical outer surface which co-operates with the internal surface of the outer joint member between the grooves thereof, and a part-spherical inner surfaces which engages surfaces provided on a number of separate elements, and

each element is disposed on a flat land between two adjacent grooves of the inner joint member, so that the balls are maintained in a plane bisecting the angle between the rotary axes of the joint members,

each of said elements comprises an outer portion of circular form with an external part-spherical surface which engages the inner part-spherical surface of the cage,

each element having a flat under surface which bears against the flat land of the inner joint member, and

each element has on the flat under surface an inwardly extending cylindrical projection extending into an axial groove located along the flat land of the inner joint member, to constrain the element so that the element can rotate about the axis of such cylindrical projection as well as move axially relative to the inner joint member.

4,464,144

V-BELT TYPE SPEED CHANGE MECHANISM

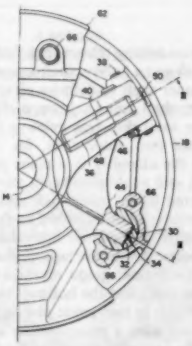
Takashi Kobayashi, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka, Japan

Filed Mar. 2, 1982, Ser. No. 353,817

Claims priority, application Japan, Mar. 10, 1981, 56/034140

Int. Cl.³ F16H *11/06, 11/02, 55/56, 55/52*

U.S. Cl. 474—14 **4 Claims**



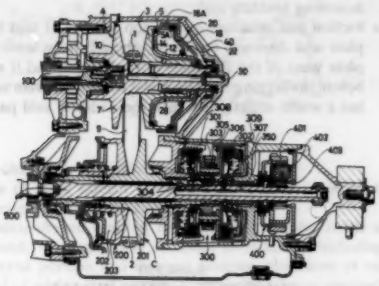
1. A V-belt type continuous speed change mechanism comprising a pulley assembly constituted by a stationary disc secured to a rotatable shaft and a movable disc axially slidable on said rotatable shaft, said stationary and movable discs each having an inclined side surface disposed opposed to each other to form a V-shaped circumferential groove therebetween, a V-belt adapted to be engaged with the opposed side surfaces of said discs with an effective radius of said pulley assembly being dependent on an axial position of said movable disc, said movable disc having at a side opposite to its side surface axially extending slider accommodating portions with recesses extending in parallel with said shaft, each of said recesses being of an arcuate a cross-section and having an axial opening toward said shaft and receiving a slider for rotation about an axis substantially parallel with said shaft, said slider being complimentary with said recess and formed with a long groove extending in parallel with and opening toward said shaft, a spider which is fixed to said shaft and formed with radial arms, each of said arms having an end portion fitted to said long groove.

4,464,145

BELT TYPE STEPLESS SHIFTER

Mutsumi Kawamoto, Nagoya, and Shiro Sakakibara, Toyokawa, both of Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Filed Dec. 3, 1980, Ser. No. 212,553
Claims priority, application Japan, Dec. 3, 1979, 54-157226
Int. Cl.³ F16H *55/52*; F01B *31/00, 7/00*
U.S. Cl. 474—28 **12 Claims**



1. A belt-type stepless shifter comprising:
(a) an input shaft,
(b) an output shaft diposed in parallel to said input shaft,
(c) a primary pulley comprising a stationary flange disposed in concentric relation to said input shaft and a movable flange slidably disposed relative to said input shaft,
(d) a secondary pulley comprising a stationary flange disposed in concentric relation relative to said output shaft and a movable flange slidably disposed in relation to said output shaft,
(e) A belt positioned on said primary pulley and said secondary pulley wherein the rotation speed ratio between said input shaft and output shaft can be converted by changing the position of the effective driving radius relative to said pulleys,
(f) a hydraulic servo means for moving at least one of said movable flanges of said pulleys, said hydraulic servo means having plural oil chambers arranged in series capable of moving said movable flange in the same direction, at least one of said oil chambers having a primary piston connected to said input shaft or said output shaft, and a movable cylinder which moves slidably on an axis together with said movable flange and another of said oil chambers comprising a stationary cylinder having an axially extending sleeve connected to said input shaft or output shaft, and a secondary piston which moves slidably on an axis together with said movable flange, wherein said movable cylinder moves slidably relative to and overlaps said stationary cylinder in the direction of said axis.

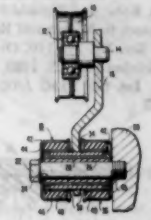
4,464,146

APPARATUS FOR MAINTAINING TENSION OF AN ENDLESS DRIVE MEMBER

Gene M. Arthur, Norwalk, Ohio, assignor to Imperial Clevite Inc., Glenview, Ill.

Filed May 17, 1982, Ser. No. 378,597
Int. Cl.³ F16H *7/12*
U.S. Cl. 474—133 **15 Claims**

1. An improved apparatus for tensioning endless drive members such as belts or chains, said apparatus comprising:
a torque arm;
means mounted on said arm for engaging an endless drive member to impart a tension maintaining force thereto;
means pivotably supporting said torque arm at a location spaced from said means for engaging, for permitting rotation of said torque arm about an axis, said supporting means comprising:
at least one elastomeric spring having a central bore surface, an outer circumferential surface and a first spring rate;
means for securing one of said surfaces against rotation about said axis;
means attached to said torque arm and the other of said surfaces for causing the other of said surfaces to rotate about said axis, whereby a countertorque is induced in or



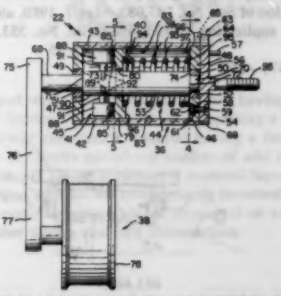
released from said elastomeric spring in response to changes in force applied to said torque arm by a drive member acting on said means for engaging; and
means, operatively associated with said means for causing said other of said surfaces to rotate, for resisting rotation by providing an essentially elastic resistance at a second, substantially higher spring rate until a predetermined breakaway torque is applied and thereafter for allowing rotation while providing a rotational drag force to damp oscillations of said apparatus.

4,464,147

BELT TENSIONER AND METHOD OF MAKING THE SAME

Randy C. Foster, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

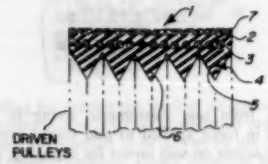
Filed Nov. 16, 1981, Ser. No. 321,369
Int. Cl.³ F16H *7/12*
U.S. Cl. 474—135 **12 Claims**



1. In a tensioner for a power transmission belt that is adapted to be operated in an endless path, said tensioner comprising a support means for being fixed relative to said belt, a belt engaging means carried by said support means and being movable relative thereto, movable cam means operatively associated with said support means and said belt engaging means for moving said belt engaging means relative to said support means, and spring means operatively associated with said support means and said cam means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt, the improvement wherein said support means comprises a tubular member having intercon-

necting means, said cam means being disposed in said tubular member, said cam means having interconnecting means operatively interconnected with said interconnecting means of said tubular member, both said interconnecting means cooperating and being adapted to permit said cam means to be axially movable relative to said tubular member while being non-rotatable relative to said tubular member.

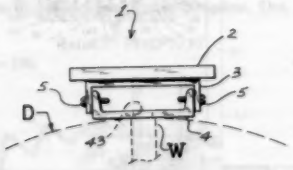
4,464,148
RIBBED BELT
Hiroyuki Tanaka, Kobe, and Tadashi Yamaguchi, Kasugai, both of Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan
Continuation of Ser. No. 196,110, Oct. 10, 1980, abandoned. This application Feb. 25, 1983, Ser. No. 469,816
Int. Cl.³ F16G *1/00, 5/00*
U.S. Cl. 474—167 **7 Claims**



1. In a drive system having a pulley provided with round tipped annular ribs with grooves therebetween defining inner sharp tips defined by substantially intersecting planar side walls of the grooves, and a complementary ribbed V-belt having a rubber body, the improvement comprising

the provision of a plurality of longitudinally extending ribs in said body defined by sharp-tipped distal ends with sharp-tipped V-grooves therebetween, the tips of the V-grooves defining a relief space to be disposed outwardly of the round-tipped pulley ribs and said distal ends having full facial contact with the pulley grooves inwardly to said inner tips.

4,464,149
UNIVERSAL LAGGING
Edward D. Klyn, 1007 Liberty, Pella, Iowa 50219
Continuation of Ser. No. 147,083, May 7, 1980, abandoned. This application Mar. 1, 1982, Ser. No. 353,147
Int. Cl.³ F16H *55/36*
U.S. Cl. 474—185 **3 Claims**



1. A replaceable lagging device, comprising:

a mounting bracket adapted for securement to either the periphery of the drum pulley or the terminal end of the wing of a wing pulley, both types of pulleys being generally cylindrical in shape about an elongated axis of rotation, said mounting bracket being an elongated U-shaped channel having a base with a relatively flat undersurface adapted to face the pulley, and having further a pair of upturned, parallel side members extending along the outer side edges of said base, said side members extending parallel to the axis of rotation of the pulley and adapted to extend outwardly and away from the pulley;

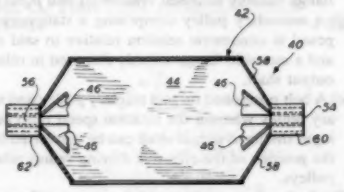
means for securing said mounting bracket to said pulley;

a backing plate releaseably secureable to said mounting bracket, said backing plate including a pair of backing side members disposed to extend inwardly toward said pulley and disposed to overlap said mounting side members, said backing plate further including a top surface disposed outwardly from said mounting bracket and outwardly from said backing side members;

means for releaseably securing said backing plate to said mounting bracket; and

a friction pad attached to said top surface of said backing plate and disposed outwardly therefrom, whereby complete wear of the thickness of the friction pad is allowed before the lagging must be replaced, and wherein said base has a width slightly less than the width of said pad.

4,464,150
COMPOSITE ACTION PULLEY
Clifford A. Holden, 29 W. Glen Rd., Rock Ridge Lake, Denville, N.J. 07834
Division of Ser. No. 168,573, Jul. 14, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 429,022
Int. Cl.³ F16H *55/40*
U.S. Cl. 474—195 **2 Claims**



1. A composite action pulley; comprising:

(a) a plurality of core plates secured together so as to longitudinally extend a substantial length along a predetermined axis of rotation and so as to be radially extending from said predetermined axis of rotation;

(b) free ends of said core plates describing a cylindrical configuration of predetermined diameter;

(c) said core plates including

(i) a diametrically disposed main core plate longitudinally bisected by said predetermined axis of rotation; and

(ii) a plurality of additional core plates longitudinally secured to said main core plate along said predetermined axis of rotation and radially extending from said main core plate so that said free ends of said main core plate and said additional core plates describe said predetermined cylindrical configuration;

(d) a cylindrical shell, having an inner diameter proximating said predetermined diameter, disposed about and secured to said free ends of said core plates;

(e) shaft means extending along said predetermined axis of rotation and secured to said core plates to facilitate mounting of the composite action pulley;

(f) each core plate at each longitudinal end thereof proximate said predetermined axis of rotation including a longitudinally extending ear of predetermined axial extent; and

(g) a cylindrical ring disposed about said ears to form said shaft means;

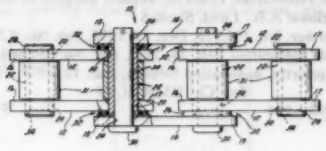
(h) said shell being secured in total to act as a beam.

4,464,151

SEALED CHAIN JOINT

James D. Kahl, Whitefish Bay, Wis., assignor to Rexnord Inc., Brookfield, Wis.

Filed Jul. 30, 1981, Ser. No. 288,579
Int. Cl.³ F16G 13/06
U.S. Cl. 474—231 8 Claims



1. A chain link assembly comprising:

a pair of inner sidebar portions, each of said inner sidebar portions defining an aperture;

a tubular-shaped bushing having opposite ends, inside and outside diameters, and an inside surface, and including a central portion and integral bushing extensions at each end of said central portion, said bushing being secured to said pair of inner sidebar portions such that said central portion extends between said inner sidebar portions and into each of said apertures, and such that said bushing extensions project beyond and adjacent to said inner sidebar portions, the inside diameter of each of said bushing extensions being tapered from a large inside diameter at the end of said bushing to a smaller inside diameter where said bushing extension meets said central portion of said bushing, and the inner diameter of said bushing at any point along said bushing extensions being larger than the smallest inside diameter of said central portion;

a pair of outer sidebar portions each defining an opening having a diameter smaller than the outside diameter of said bushing extensions, one of said outer sidebar portions being adjacent to one of said bushing extensions, and the other of said outer sidebar portions being adjacent to the other of said bushing extensions, and said openings in said pair of outer sidebar portions being substantially aligned with said apertures in said pair of inner sidebar portions;

a pair of resiliently flexible sealing members, one of said sealing members encircling one of said bushing extensions and being positioned between and engaging said adjacent inner sidebar portion and said adjacent outer sidebar portion, and the other of said sealing members encircling the other of said bushing extensions and being positioned between and engaging said adjacent inner sidebar portion and said adjacent outer sidebar portion, each of said sealing members being annular and comprising a plurality of radially spaced-apart annular concentric ridges, alternate ones of said ridges engaging said inner and outer sidebar portions, respectively, said sealing member providing at least two ridges in engagement with said inner sidebar portion and at least two ridges in engagement with said outer sidebar portion; and

a pin extending through said openings in said outer sidebar portions and through said bushing to form a chain joint.

4,464,152

METAL POWER TRANSMISSION BELT

John M. Kern, Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

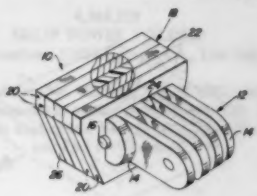
Filed Feb. 1, 1982, Ser. No. 344,679
Int. Cl.³ F16G 1/26, 51/80
U.S. Cl. 474—245 7 Claims

1. A metal chain-belt especially adapted for use in a pulley drive system which comprises:

a plurality of links arrayed in a plurality of interleaved sets;

pivot means joining the sets of links to form an endless chain-belt;

a plurality of spaced, generally trapezoidal-shaped load blocks with edges for contacting said pulleys, one block being positioned between each pair of adjacent pivot means and each load block comprising a plurality of like



flat plates, each plate having a central opening permitting its assembly on a set of links; and

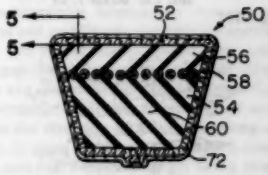
a sound damping means between a pair of next adjacent plates in at least some of said load blocks, said damping means also being generally trapezoidal in shape and generally the same transverse size as said plates.

4,464,153

COVERED V-BELT HAVING REDUCED COEFFICIENT OF FRICTION SIDES

James K. Brew, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 147,431, May 6, 1980, Pat. No. 4,355,994.
This application Sep. 20, 1982, Ser. No. 420,533
Int. Cl.³ F16G 5/16
U.S. Cl. 474—270 2 Claims



1. A wrapped molded V-belt construction having reduced coefficient of friction outside surfaces comprising a belt body made primarily of elastomeric material having a fabric cover which covers the entire peripheral outline of said belt body, wherein said cover has an elastomeric material layer containing finely divided metallic material defining its outside surface, said metallic material being vacuum deposited on said elastomeric layer after curing said belt construction.

4,464,154

METHOD OF MAKING RECLOSABLE POUR OPENING STRUCTURE FOR A PACKAGING CONTAINER

Billy Ljungcrantz, Chatel-St-Denis, Switzerland, assignor to Tetra Pak Developpement SA, Lausanne, Switzerland

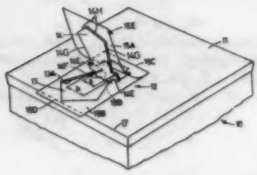
Division of Ser. No. 29,875, Apr. 13, 1979, Pat. No. 4,258,876.
This application Dec. 29, 1980, Ser. No. 220,891
Claims priority, application Switzerland, Apr. 17, 1978, 4092/78
Int. Cl.³ B31B 1/84
U.S. Cl. 493—87 2 Claims

1. Method of making a reclosable opening structure in a panel of a packaging container, comprising the steps of

applying to one face of the panel a foil strip and inseparably uniting a first segment of the foil strip with the panel over

substantially the entire area with which the first segment overlies the panel,

cutting through the first foil segment and the panel along an opening boundary line thereby providing within said area a removable section comprising congruent panel and inner foil sections enclosed by the opening boundary line forming a severance line, and



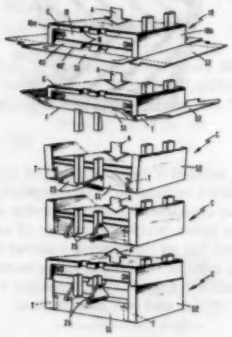
while retaining the removable section enclosed by the opening boundary line in its original position, applying over the first foil strip segment a second foil strip segment and inseparably uniting the second foil strip segment with the first foil strip segment both within at least a portion of the area enclosed by the opening boundary line at a junction outside said zone, said first and second foil strip segments further being united by a sealed but separable union situated outside and extending about said area.

4,464,155

APPARATUS AND METHOD FOR FORMING AND DEBOWING CARTONS

Peter C. Cellura, Los Altos; Boyd D. Goda, Santa Clara, and Harvey N. Palagi, San Carlos, all of Calif., assignors to Kliklok Corporation, Greenwich, Conn.

Filed Dec. 11, 1981, Ser. No. 329,878
Int. Cl.³ B31B *1/48*
U.S. Cl. 493—137 **16 Claims**



1. In an apparatus for forming flat cut carton blanks into erect cartons having side panels attached to a bottom panel along fold lines therebetween, said apparatus including a forming head having opposed side walls, and reciprocating moving means enabling the forming head to receive and direct a carton blank through a die into erected condition with the side panels of the carton engaging the side walls, the improvement comprising:

(a) cutout openings formed in the side walls of the forming head allowing the erected side panels to bend inwardly from the fold lines; and

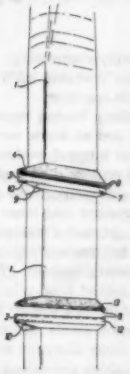
(b) pressing means operatively positioned in the path of the forming head to engage and crease the fold line and direct the erected side panels inwardly into the cutout openings to a sufficient extent for overbreaking and debowing the carton side panels.

4,464,156

METHOD OF MANUFACTURING PARALLELEPIPEDIC PACKING CONTAINER PROVIDED WITH AN OPENING ARRANGEMENT

Sven N. H. Holmström, Löberöd, Sweden, assignor to Tetra Pak International A.B., Lund, Sweden

Division of Ser. No. 105,915, Dec. 21, 1979, Pat. No. 4,343,402. This application Feb. 24, 1982, Ser. No. 351,868
Claims priority, application Sweden, Jan. 15, 1979, 7900315
Int. Cl.³ B31B *33/14*
U.S. Cl. 493—194 **5 Claims**



1. A method of manufacturing packing containers from a packing material web comprising the steps of:

joining longitudinal edges of the web to form a tube;

flattening discrete transverse sections of the tube at longitudinally spaced intervals to create individual closed packing containers, each of said flattened transverse sections having an upper edge zone and a lower edge zone;

forming two parallel sealing zones adjacent said upper edge zone in each of the flattened transverse sections, said sealing zones being substantially perpendicular to the axis of the tube;

providing an unsealed area of substantial width between said sealing zones and said lower edge zone of said flattened sections; and

cutting each of the flattened sections between the parallel sealing zones to create sealing fins for separate packing containers, each packing container having an upper sealing fin which is substantially wider than a lower sealing fin, said unsealed area being located in said upper sealing fin.

4,464,157

METHOD OF PREPARING A THERMOPLASTIC BAG HAVING REINFORCED HANDLES

Gordon L. Benoit, Macedon; Jack J. Donaldson, Fairport, and Paul D. Heilman, Williamson, all of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

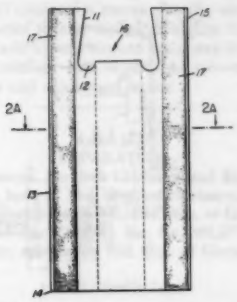
Continuation of Ser. No. 308,759, Oct. 5, 1981, abandoned, which is a division of Ser. No. 086,374, Oct. 18, 1979, which is a continuation of Ser. No. 945,765, Sep. 25, 1978, abandoned. This application Jan. 11, 1984, Ser. No. 569,925
Int. Cl.³ B31B *23/00, 1/86*
U.S. Cl. 493—211 **9 Claims**

1. A method of forming a gusseted thermoplastic bag, comprising the steps of:

coextruding a tube of at least two thermoplastic resins, one

of said extruded resins forming a continuous tube body and the other of said extruded resins forming a plurality of reinforcement strips extending longitudinally along at least a portion of said continuous tube body;

forming said coextruded tube into a plurality of separated, flattened, side edge gusseted tubes which are sealed at both ends, said side edge gusseted tubes being formed such that said reinforcement strips extend longitudinally of at least a portion thereof and such that at least two reinforcement strips overlap one another at areas adjacent each of opposite side edges of said gusseted tubes; and



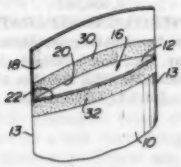
removing a cut-out from a flattened portion at one end of each of said gusseted tubes and between the overlapping reinforcement strips located at said areas adjacent the opposite side edges of said gusseted tubes to provide an open mouth portion having handle loops adjacent thereto and at opposite sides thereof, at least a part of each of said handle loops being reinforced with said reinforcement strips.

4,464,158

METHOD OF MAKING TAMPERPROOF BAG CLOSURE

Donald R. Kardon, 134 N. Narberth Ave., Narberth, Pa. 19072

Filed Apr. 27, 1982, Ser. No. 372,308
Int. Cl.³ B31B *1/62*
U.S. Cl. 493—265 **8 Claims**



1. A method of applying a tamperproof bag closure means to a bag having a pair of side walls providing an opening at one end and a flap extending from one side wall adapted to be folded over from said side wall along a fold line to overlap the outside of the other side wall to enclose the bag opening with a tamperproof closure, comprising the steps of:

(1) depositing in one application a single band of a powder of microcapsules in a binder system onto the inside surface of the bag flap and onto a portion of the outside surface of the other side wall in areas that are in overlapping relation when the flap is folded along said fold line onto the other side wall to enclose the bag opening, said band area on the bag flap and other side wall being on both sides of said fold line and completely enclosing the bag opening to provide a tamperproof bag closure condition when the bag flap is folded over along said fold line to place said band areas in contact,

said microcapsules containing an adhesive core enclosed by a non-adhesive shell,

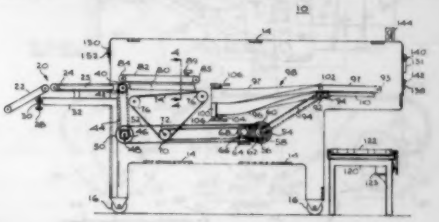
(2) and drying said binder system to drive off binder ingredients so as to leave the microcapsules adhered to the bag.

4,464,159

SHOP TOWEL FOLDER

Frederick W. Grantham, 12055 Goshen Ave., Los Angeles, Calif. 90049

Continuation of Ser. No. 405,900, Aug. 6, 1982, abandoned, which is a continuation of Ser. No. 230,459, Feb. 2, 1981, abandoned. This application Jun. 10, 1983, Ser. No. 503,259
Int. Cl.³ B65H *45/14*
U.S. Cl. 493—419 **14 Claims**



1. A shop towel folder comprising:

a housing having opposed feed and discharge ends;

a feed board conveyor adjacent the feed end for receiving and transporting shop towels provided individually by an operator;

a further endless conveyor for receiving shop towels from the feed board conveyor and directing them in succession to a first flipper assembly, said further endless conveyor having substantially horizontally oriented upper and lower runs and said flipper assembly comprising a pair of generally flat flipper blades spaced from each other to define a gap therebetween and mounted directly below the lower run of said further conveyor, said flipper blades being pivotably mounted for rotation about axes generally parallel to the direction of movement along said further conveyor to open said gap and permit a towel to drop through, said first flipper assembly being mounted adjacent said further conveyor in position to receive shop towels therefrom individually in succession;

a photo-responsive device associated with the first flipper assembly for detecting the presence of a shop towel thereon;

a narrow folding belt longitudinally aligned with and below said gap for receiving shop towels dropped thereon one at a time in succession to form a stack, said belt being significantly narrower than the width of the shop towels so that as a towel is dropped through said gap a portion of it will be intercepted by the folding belt, thereby causing the towel to fold about a generally longitudinal center line of the towel and the folding belt;

means for selectively driving the folding belt longitudinally to deliver the folded towels by stacks to a succeeding transition conveyor at intervals corresponding to a preselected count of towels in a stack as determined by signals from said photo-responsive device;

a transition conveyor positioned to receive stacks of folded towels delivered by the folding belt in a vertical orientation and to deliver said stacks to a second flipper assembly in a horizontal orientation for discharge at the discharge end; and

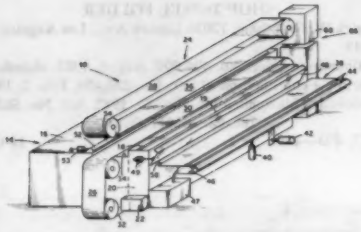
means for selectively driving said further conveyor and for selectively activating the flipper assemblies in accordance with predetermined control and timing signals.

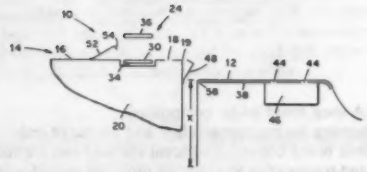
4,464,160

METHOD AND APPARATUS FOR FORMING A HEM IN FABRIC FLAT GOODS

William R. Joyce, Gerton, N.C., assignor to Tex-Fab, Inc., Gerton, N.C.

Filed Sep. 14, 1981, Ser. No. 301,539
Int. Cl.³ B65H *44/22*; D05B *35/02*
U.S. Cl. 493—448 7 Claims





1. An apparatus for forming a hem in fabric flat goods, comprising:

a table upon which the hem is to be formed, the top of said table being formed with a longitudinally extending vacuum slot along one longitudinal side of the table top;

vacuum producing means operatively associated with said vacuum slot for selectively producing a vacuum condition at said vacuum slot while said hem is being formed;

major hem forming plate means movable to and from a position generally overlaying said vacuum slot in the table top for forming a major hem along the entire length of the fabric flat goods at one time;

minor hem forming plate means movable to and from a position generally overlaying said vacuum slot in the table top after said major hem forming plate means has moved away from the table top for forming a minor hem along the entire length of the fabric flat goods at one time; and,

movable clamping means for clamping the major and minor hems and delivering the hemmed flat goods to a sewing station after said vacuum condition has been removed.

5. A method of forming a hem in fabric flat goods, comprising the steps of:

folding the border of the fabric flat goods back over to form a major hem;

applying a vacuum condition to the fabric flat goods near the free edge of the major hem to hold the major hem in place;

folding the free edge back into the fold of the major hem to form a minor hem;

clamping the major and minor hems together in a movable clamping device;

removing the vacuum condition from the fabric flat goods; and,

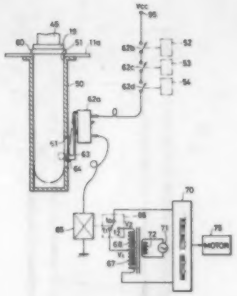
moving the clamped together major and minor hems to a sewing station.

4,464,161

SAFETY DEVICE FOR CENTRIFUGAL SEPARATORS

Tadahiro Uchida, Sayama; Hiizu Wakita, Tokyo, and Minoru Hara, Sakado, all of Japan, assignors to Kabushiki Kaisha Kubota Seisakusho, Tokyo, Japan

Filed Feb. 8, 1983, Ser. No. 464,815
Claims priority, application Japan, Feb. 19, 1982, 57-23381
Int. Cl.³ B04B *5/02*
U.S. Cl. 494—7 15 Claims



1. A safety device in a centrifugal separator having an outer box and a rotor disposed therein and capable of selectively mounting thereon a plurality of sedimentation tube containers each capable of receiving therein a sedimentation tube containing a sample to be subjected to centrifugal separation and mounting thereon a plurality of capillary tubes for centrifugal separation of samples contained therein, said safety device comprising:

receptacle means mounted in said outer box for receiving all of the sedimentation tube containers from the exterior of the outer box;

detecting means associated with said receptacle means for detecting when all of the sedimentation tube containers are received in said receptacle means; and

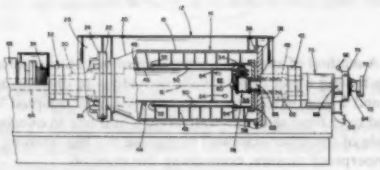
setting means responsive to an output from said detecting means for enabling the rotor to rotate at a relatively high speed required when the capillary tubes are mounted on the rotor.

4,464,162

CENTRIFUGAL SEPARATOR

John R. Cummings, North Abington, Mass., assignor to Bird Machine Company, Inc., South Walpole, Mass.

Filed Mar. 24, 1983, Ser. No. 478,220
Int. Cl.³ B04B *11/08*
U.S. Cl. 494—53 29 Claims



1. In a centrifugal separator having a rotary bowl for receiving feed which forms a pool in the bowl, a skimmer movably mounted to fixed support structure within the bowl having an inlet for removing liquid from the pool and an outlet for said removed liquid to a discharge system with an outlet external to the bowl, and adjustment means operable from outside the bowl for adjustably moving said skimmer oppositely toward

and away from the bowl axis to vary the amount of liquid retained in the pool;

the improvement wherein said adjustment means comprises (a) skimmer mounting means within said bowl at one side of the bowl axis movably connecting said skimmer to said fixed support structure at said side of said bowl axis so as to enable said adjustment movements thereof by said adjustment means and so that the hydraulic thrust of the pool liquid against said skimmer is applied by said mounting means substantially entirely to said fixed support structure, and (b) connection means movalby connecting said skimmer outlet to said discharge system for movement relative to said system toward and away from the bowl axis in accordance with adjustment movements of said skimmer by said adjustment means.

4,464,163

SEPARATOR

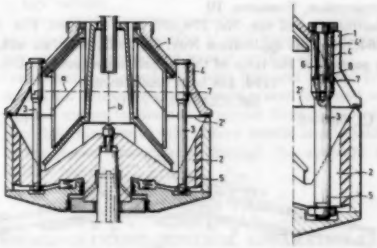
Wolfgang Heckmann, Bergisch Gladbach, and Karl Koslowski, Hamminkeln, both of Fed. Rep. of Germany, assignors to Klockner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Jan. 21, 1982, Ser. No. 341,277

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1981, 3101713

Int. Cl.³ B04B *7/04*

U.S. Cl. 494—64 **7 Claims**



1. A centrifuge rotor of the disc-bowl type having a dynamically balanced casing assembly, said assembly comprising:

a first and a second rotor casing part, said parts being hollow to define the bowl, and each having a frustoconical inner wall spaced from each other and respectively leading to a continuous peripheral gap between said parts for the discharge of separated solids; and

a series of bolt assemblies secured to said casing parts and holding said casing parts in axially spaced relation to each other, said bolt assemblies being disposed in equally spaced relation on a bolt circle lying radially inwardly from said continuous peripheral gap, each of said bolt assemblies having an upper portion snugly carried by said first casing part, a separate lower portion snugly carried by said second casing part, said portions being concentrically joined together within said bowl;

whereby on re-assembly, said bolt assemblies will reestablish the dynamic balance.

4,464,164

FLOWRATE CONTROL FOR A BLOOD FLOW SYSTEM

Vernon H. Troutner, St. Petersburg, and Richard A. Morrow, Tarpon Springs, both of Fla., assignors to Extracorporeal Medical Specialties, Inc., King of Prussia, Pa.

Filed Sep. 24, 1982, Ser. No. 423,381

Int. Cl.³ A61M *1/03*

U.S. Cl. 604—5 **7 Claims**

1. An extracorporeal blood flow system for circulating blood of a patient comprising:

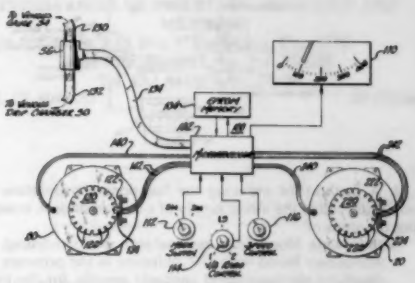
a first, arterial blood pump having an input adapted to receive blood of a patient and an output;

blood processing apparatus having an input coupled to the output of said arterial blood pump and an output;

a second, venous blood pump having an input coupled to the output of said blood processing apparatus and an output adapted to provide processed blood;

means, coupled to said first and second blood pumps, for producing information indicative of the speeds of said blood pumps;

means, coupled to said speed information producing means,



for converting said speed information to flowrate information of said pumps;

means, responsive to said flowrate information produced by said converting means, for determining mean blood flowrate;

a pump speed ratio control which produces an output signal indicative of a desired pump speed ratio; and

pump speed control means, coupled to said blood pumps and responsive to said mean blood flowrate determination and said desired pump speed ratio, for controlling said pump speeds in accordance with said desired pump speed ratio so as to maintain a desired mean blood flowrate.

4,464,165

MATERIAL AND METHOD FOR REMOVING IMMUNOGLOBULINS FROM WHOLE BLOOD

John K. Pollard, Jr., Del Mar, Calif., assignor to American Hoechst Corporation, Somerville, N.J.

Division of Ser. No. 209,872, Nov. 24, 1980, Pat. No. 4,409,330. This application Oct. 5, 1983, Ser. No. 539,210

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—5 **7 Claims**

5. A method of retarding the growth of neoplasts in subject mammals suffering from same, which method comprises:

a. contacting the blood of said subjects in an extra-corporeal circulating system with an immunoadsorbent material comprising inactivated, protein A-bearing *Staphlococcus aureus* bacteria immobilized in a polymeric matrix said material being in the form of gel like beads having an average diameter ranging from 100 to 1000 microns and

b. transfusing said subjects contacted blood back into the host subject.

4,464,166

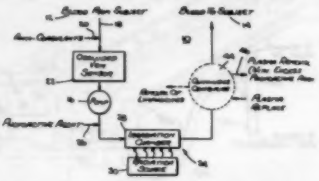
METHOD FOR EXTERNALLY TREATING THE BLOOD

Richard L. Edelson, Roseland, N.Y., assignor to Frederic A. Bourke, Jr.; Eleanor F. Bourke; Richard L. Edelson and The Edelson Trust, all of East Norwalk, Conn.

Division of Ser. No. 272,981, Jun. 12, 1981, Pat. No. 4,398,906, which is a continuation-in-part of Ser. No. 102,553, Dec. 11, 1979, Pat. No. 4,321,919. This application Jun. 30, 1983, Ser. No. 509,807

Int. Cl.³ A61M *1/03*

U.S. Cl. 604—6 **19 Claims**



1. A method for reducing the functioning population of a nucleated cell in the blood supply of a human subject, comprising the steps of:

withdrawing blood from said subject, and irradiating said withdrawn blood with UV radiation in the presence of a dissolved photoactivated antibody specific for the nucleated blood cell and capable when activated by said UV radiation of forming photoadducts with the nucleated blood cell, to thereby effect chemical bonding between said photoactivated antibody and the nucleated cells, thereby creating irreversible complexes of said antibody and said nucleated blood cells; and returning the irradiated blood to said subject.

4,464,167

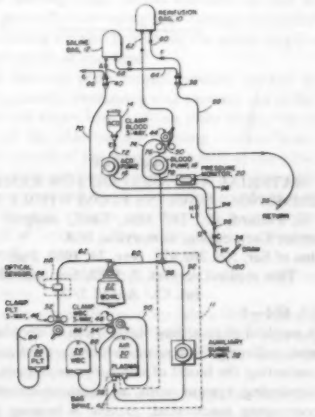
PHERESIS APPARATUS

Donald W. Schoendorfer, Brookline, and Lee E. Hansen, Wellesley, both of Mass., assignors to Haemonetics Corporation, Braintree, Mass.

Continuation of Ser. No. 299,194, Sep. 3, 1981, Pat. No. 4,416,654. This application Aug. 1, 1983, Ser. No. 518,956

Int. Cl.³ A61M *1/03*

U.S. Cl. 604—6 **6 Claims**



1. Apparatus comprising:

(a) a centrifuge bowl;

(b) an enclosed fractionation volume within said bowl;

(c) an inlet and outlet port mounted on said bowl, the ports being in fluid communication with said fractionation volume;

(d) a phlebotomy needle coupled by a first conduit to a source of anticoagulant and to said inlet port;

(e) a source of anticoagulant;

(f) receptacle means outside said centrifuge and coupled by a second conduit to said outlet port for collecting a first fractionated whole blood component from said outlet port;

(g) blood pump means for first causing whole blood to flow through said phlebotomy needle and said first conduit into said inlet port at a predetermined rate;

(h) anticoagulant pump means for causing anti coagulant from said source of anticoagulant to mix with said whole blood in said first conduit; and

(i) surge pump means for causing a first fractionated component of anticoagulated whole blood to be recirculated to the inlet port of said centrifuge to elutriate the contents in the fractionation volume.

4,464,168

LOW PROFILE SHUNT SYSTEM

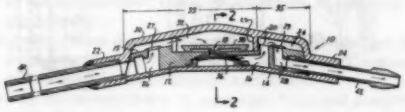
Russell J. Redmond, Santa Barbara, and Donald L. Hannula, Goleta, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 279,107, Jun. 30, 1981, Pat. No. 4,364,395. This application Nov. 26, 1982, Ser. No. 444,559

The portion of the term of this patent subsequent to Dec. 21, 1999, has been disclaimed.

Int. Cl.³ A61N *27/00*

U.S. Cl. 604—9 **14 Claims**



1. A shunt system for implantation in the body comprising:

a body having an upper and lower surface and a distal end and a proximal end, the body including a fluid passageway extending between the distal end and proximal end, which fluid passageway includes a first portion extending from the distal end to a first port on the upper surface to a second portion of the fluid flow passageway, which second portion extends from the first port to a second port on the upper surface, and a third portion of the fluid flow passageway extending from the second port to the proximal end;

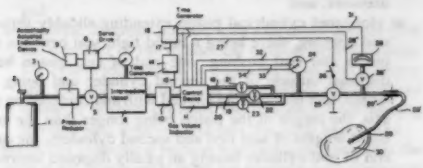
a resilient dome extending over the upper surface of the body and the second portion of the fluid flow passageway, a first portion of the resilient dome extending over the first port on the upper surface, which first port provides fluid flow between the first portion of the fluid passageway and the second portion wherein the first portion of the resilient dome upon flexing cooperates with the first port to occlude the first port, and a second portion of the resilient dome extending over the second port on the upper surface, which second port provides fluid flow between the second portion and the third portion of the fluid passageway wherein the second portion of the resilient dome upon flexing cooperates with the second port to occlude the second port; and

a valve means within the fluid passageway for opening the fluid passageway to fluid flow at selected fluid pressures in the fluid passageway.

4,464,169
APPARATUS AND METHOD FOR INSUFFLATING FLUID MEDIA INTO A CAVITY

Kurt Semm, 4 Hegewischstrasse, D 2300 Kiel 1, Fed. Rep. of Germany

Filed Oct. 15, 1981, Ser. No. 311,515
Int. Cl.³ A61M 13/00
U.S. Cl. 604—26 25 Claims



1. A device for insufflating fluid media such as CO_2 gas into a cavity of a human or animal body comprising;

a vessel containing a pressurized fluid medium;

measuring means for measuring the pressure of said medium in said cavity;

a hollow needle having an aperture for insufflating said fluid medium into said cavity;

an interruptible first conduit means having one end connected to said vessel and the other end connected to said needle for conducting said fluid medium from said vessel to said needle;

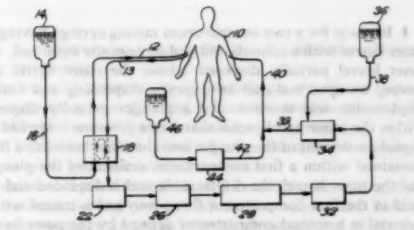
an interruptible pressure measuring second conduit means having one end connected to said measuring means and the other end connected to said needle; and

valve means connected with said first and second conduit means for alternately interrupting said first and second conduit means to alternately permit flow of said pressurized fluid medium to said hollow needle and to said measuring means respectively through the aperture in the hollow needle.

4,464,170
BLOOD GLUCOSE CONTROL APPARATUS AND METHOD

A. H. Clemens, Elkhart, Ind., and David L. Hough, Edwardsburg, Mich., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Sep. 29, 1982, Ser. No. 428,381
Int. Cl.³ A61M 5/00
U.S. Cl. 604—50 4 Claims



3. In a method for controlling the concentration of glucose in the blood stream of a subject at a desired level (BI) including controlling the supply of insulin by periodically measuring the blood glucose concentration (G) and selecting a predetermined basal infusion rate (RI) for the desired level, the improvement wherein the step of selecting a predetermined basal infusion rate comprises periodically searching for and determining the value of the predetermined basal infusion rate RI required for BI in accordance with

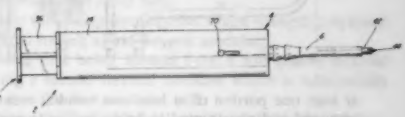
$$RI = RI_{LAST}(GY/BI)$$

said steps of searching and determining including determining the present blood glucose concentration (GY), fitting a plurality of blood glucose determinations (G) to a least squares regression line, determining if the slope of the least squares regression line fit for the last five G values is less than 0.5 and if GY is within ±50% of the desired BI level, said steps of searching and determining being conducted at periods equal to or greater than the period between glucose measurements.

4,464,171
INTRAVASCULAR INSERTION APPARATUS AND METHOD

Mark J. Garwin, P.O. Box 4733, Odessa, Tex. 79760

Filed Mar. 29, 1982, Ser. No. 363,085
Int. Cl.³ A61M 5/00, 25/00
U.S. Cl. 604—53 13 Claims



1. An intravascular insertion apparatus, comprising:

a suppport body including a syringe having a needle associated therewith, said needle having a passageway defined therethrough and said needle being slidably disposable within a catheter;

an elongated guide member slidably disposed in said passageway, said guide member having a first end disposed within said syringe externally of said passageway and having a second end disposed for being movable from a first locus within said passageway to a second locus externally of both said passageway and syringe; and

movement means, associated with said syringe and responsive to finger action of a hand maintaining a continuous hold on said syringe, for moving said guide member between said first and second loci independently of movement of the catheter when said needle is slidably disposed in the catheter.

4,464,172
COMPUTER-CONTROL MEDICAL CARE SYSTEM

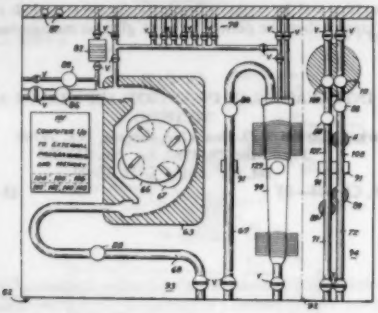
Eric S. Lichtenstein, 420 Taconic Rd., Greenwich, Conn. 06830

Division of Ser. No. 34,539, Apr. 30, 1979, Pat. No. 4,379,983, which is a continuation-in-part of Ser. No. 915,472, Jun. 14, 1978, abandoned, which is a continuation of Ser. No. 670,688, Mar. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 625,738, Oct. 24, 1975, abandoned, which is a division of Ser. No. 494,006, Jul. 31, 1974, Pat. No. 3,946,731, which is a continuation-in-part of Ser. No. 3,912,455, Oct. 14, 1975, which is a continuation-in-part of Ser. No. 108,118, Jan. 20, 1971, Pat. No. 3,774,762, and Ser. No. 157,942, Jun. 29, 1971, abandoned.
This application Jan. 6, 1981, Ser. No. 222,772
Int. Cl.³ A61M 1/03
U.S. Cl. 604—65 13 Claims

1. Modular vessel structure, hereinafter termed "module", arranged and constructed for carrying out a specific medical procedure in cooperation with an apparatus for use with said apparatus which includes fluid-transfer means, sensor and signalling means, valve means and computer means programmable for carrying out a plurality of medical procedures including said specific medical procedure, and indicator means for indicating appropriate adjustment to be made in said procedure, the term "medical procedure" being taken to include therapeutic and diagnostic procedures, said sensor means being arranged and constructed for sensing a variable relevant to a fluid within said module and relevant to the progress of said

procedure, said signalling means connecting said sensor means with said computer means for communicating the value of said property thereto, said module comprising:

a plurality of conduit means arranged in a pattern for cooperation with said apparatus, a sufficient portion of at least one conduit means being arranged and constructed to be accessible for cooperating with said fluid-transfer means for transfer of fluid therethrough at a controlled rate, and



at least one portion of at least one conduit means being arranged and constructed to be accessible to said sensor and signalling means for the said sensing of said property, said module including designation means for indicating to said apparatus and thereby to said computer means the procedure for which said module is designed, thereby enabling said computer means to establish whether there is correspondence between said module and a selected program.

4,464,173

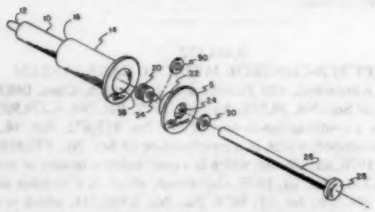
MEDICAL SYRINGE

John A. Tartaglia, 108 Stoddard Rd., Waterbury, Conn. 06708

Filed Dec. 8, 1982, Ser. No. 447,775

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—89 **3 Claims**



1. A medical syringe comprising:

a first hollow elongated cylinder having a first inner diameter, one end of the first cylinder being open, the opposite end of the first cylinder being closed and provided with sealed means adapted to detachably receive a hypodermic needle;

a second hollow elongated cylinder having a second and larger inner diameter, one end of the second cylinder being open, the opposite end of the second cylinder having centered therein a circular port with a diameter equal to the first diameter, said cylinders being disposed end to end along a common cylindrical axis, the opposite end of the second cylinder being secured to the open end of the first cylinder with said port being coincident with the open end of the first cylinder;

a sealing disc centered on said axis and being non rotatably slidable back and forth in said cylinders along said axis, said disc having a diameter equal to said first diameter and when disposed in said first cylinder engaging the inner surface thereof with a liquid tight seal, said disc having an axially aligned member having an external thread and extending toward said second cylinder;

a bushing disposed in the open end of the second cylinder and having a circular opening centered on said axis, said opening having a third diameter smaller than said first diameter, and

an elongated cylindrical piston extending slidably through said opening, there being a liquid tight seal between said piston and said bushing, one end of said piston being disposed outside of the second cylinder and being enlarged, said piston being aligned with and centered on said axis, the length of the piston being longer than the combined lengths of said first and second cylinders, the other end of said cylinder having an axially disposed internally threaded bore which is engagable with said member when the piston is rotated in one direction about said axis and is disengagable from said member when the piston is rotated in opposite direction.

4,464,174

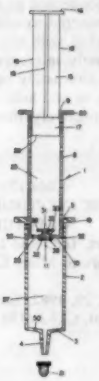
TWO COMPARTMENT MIXING SYRINGE SEAL

James Ennis, Preston, Conn., assignor to Silver Industries, Inc., Norwich, Conn.

Filed Sep. 27, 1982, Ser. No. 424,432

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—90 **12 Claims**



1. In a seal for a two compartment mixing syringe having an outer barrel with a cannula end and an opposite open end, and inner barrel partially disposed within the outer barrel and having an open end and an opposite dispensing end with a displaceable seal thereon, and a plunger partially disposed within the inner barrel, such that when pressure is applied by digital movement of the plunger into the inner barrel to a fluid contained within a first compartment defined by the plunger and the inner barrel, the displaceable seal is displaced and the fluid in the first compartment flows into and is mixed with a material in a second compartment defined by the outer barrel and the inner barrel, and by digital movement of the inner barrel within the outer barrel the resulting mixture is passed through the cannula and out of the syringe,

the improvement comprising a said seal having in combination an aperture in the dispensing end of the inner barrel and a monolithic plug made of a single resilient and compressible material and disposed in the said aperture, said plug comprising:

a cylindrical portion of said resilient and compressible material with a diameter such that it is compressibly

disposed in said aperture and seals said aperture against fluid leakage therethrough but is displaceable from said aperture by fluid pressure exerted by digital movement of the plunger into the inner barrel;

a reduced diameter portion such that when said cylindrical portion is displaced from said aperture a fluid pathway from the inner barrel to the outer barrel is provided between the aperture and the reduced diameter portion; and

an increase diameter portion with a diameter greater than the diameter of the cylindrical portion such that when the cylindrical portion is displaced from said aperture and the said fluid pathway is provided, the increased diameter portion prevents the said plug from passing through said aperture and into the outer barrel; and

wherein the cylindrical portion is of such a diameter that the plug is not displaceable from the aperture until substantial fluid pressure is exerted into the first compartment and when that said substantial pressure is exceeded, the cylindrical portion quickly exits the aperture and comes to an abrupt halt when the increased diameter portion contacts the inside surface of the inner barrel dispensing end, and

whereby the fluid passing from the first compartment impinges against the cylindrical portion and produces a dispersed form of the fluid which, thus, improves the mixing of the fluid with the material in the second compartment.

4,464,175

MULTIPURPOSE TAMPONADE AND THROMBOSCLEROTHERAPY TUBE

Alan R. Altman, 1203 Buena Vista Dr., and Jorge G. Gutierrez, 544 Los Nietos, both of Palm Springs, Calif. 92262

Filed Aug. 25, 1982, Ser. No. 411,543
Int. Cl.³ A61M *25/00*
U.S. Cl. 604—99 **12 Claims**

1. A multipurpose tamponade and thrombosclerotherapy tube comprising:

an elongated transparent tube including a closed end and an opposite open end having at least one window aperture in the tube spaced from the closed end thereof,

an inflatable balloon mounted over the tube at a spaced interval from the window aperture,

a catheter bonded to the tube and extending therealong, said catheter having one end within the balloon and having side openings spaced at intervals along said end within the balloon,

a substantially cylindrical cap mounted to said open end of the tube and extending outwardly therefrom and having a catheter coupling opening in the cylindrical wall thereof, and,

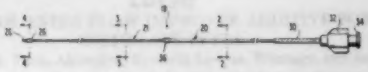
a flexible nipple diaphragm mounted over the extending open end of said cap, said diaphragm having a closable aperture to permit entry into the tube and provide an effective tube seal said diaphragm further permitting release of pressure in the tube through said aperture.

4,464,176

BLOOD VESSEL CATHETER FOR MEDICINE DELIVERY AND METHOD OF MANUFACTURE

Bandula Wijayarathna, Friendswood, Tex., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Jun. 4, 1982, Ser. No. 385,334
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—164 **17 Claims**



1. A catheter which is capable of delivering drugs into a blood vessel at a selected point, comprising:

an inner tube;

an outer tube surrounding and being laminated to the outside of the inner tube;

said outer tube having a distal portion extending beyond a distal end of the inner tube;

said inner tube being formed from a high strength polymeric material having a first flexural modulus;

said outer tube being formed from a soft plastic material having a second flexural modulus which is substantially less than the first modulus; and

said inner tube and said distal section of the outer tube having inner diameters permitting insertion of a guide wire therein;

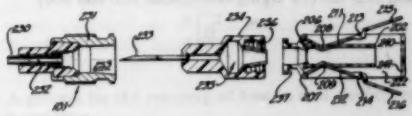
wherein the distal section of the outer tube has an outer diameter which is less than the outer diameter of the remaining portion of the outer tube, and the outer tube has a slightly enlarged section bridging the distal end of the inner tube.

4,464,177

DIFFERENTIAL PRESSURE DEVICE FOR ACCELERATED CATHETER FLASHBACK

John McGaughey, Tampa; W. Patrick McVay, Clearwater, and William Lauer, Valrico, all of Fla., assignors to Critikon, Inc., Tampa, Fla.

Filed Nov. 17, 1982, Ser. No. 442,388
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—168 **5 Claims**



1. In a vascular fluid withdrawal or introduction device the improvement comprising, apparatus for confirming placement through creation of flashback, including:

an elastomeric housing defining a chamber, adapted to communicate with said device at one end; and

at least a pair of oppositely facing compression arm means embracing said housing, said means being hingedly coupled at said one end, said arm means having at least two compression fulcra intermediate its ends,

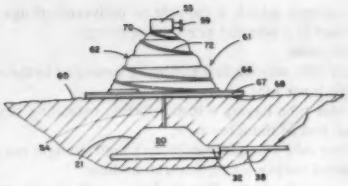
whereby compression together of said arms causes said fulcra successively to compress said chamber closed from said one end to the other, preceding fulcra being disengaged as successive fulcra are engaged.

4,464,178

METHOD AND APPARATUS FOR ADMINISTRATION OF FLUIDS

Michael J. Dalton, 9432 Monticello Ave., Evanston, Ill. 60203

Filed Nov. 25, 1981, Ser. No. 325,045
Int. Cl.³ A61M 25/02, 5/00
U.S. Cl. 604—174 11 Claims



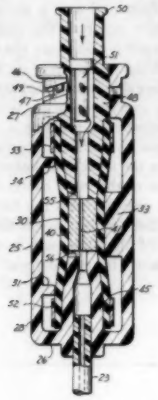
9. An anchor for an elongated hollow transcutaneous fluid delivery conduit which comprises a resilient protective boot including a plurality of concentric annular rings having inside and outside peripheries and stacked using said conduit as an axis, beginning with a base ring carrying adhesive for attachment to the skin of a living body, and ending with a terminal ring to be attached to said conduit, each annular ring in the stack being flexibly connected to the next adjacent ring alternately at inside and outside peripheries to provide shock-absorbing extension and compression along said axis, and providing means, when said terminal ring is attached to said conduit to urge, said protective boot into a compressed state along said axis, thereby urging said conduit into said body.

4,464,179

MEDICAL FLUSHING VALVE

Larry N. Barger, deceased, late of Glendale, Calif.; by William A. Barger, administrator, Garfield, Kans., and Kenneth R. McCord, Menlo Park, Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

Continuation-in-part of Ser. No. 245,580, Mar. 20, 1981, Pat. No. 4,381,591, which is a division of Ser. No. 32,832, Apr. 24, 1979, Pat. No. 4,267,835. This application Nov. 26, 1982, Ser. No. 437,247
Int. Cl.³ A61M 5/00
U.S. Cl. 604—250 15 Claims



1. A medical flushing valve comprising:

an elastically distortable tube with a noncircular outer surface that includes a force concentrating section;

a protector housing extending around the elastically distortable tube;

means on the protector housing for preventing rotation of the elastically distortable tube; and

a restrictor in the tube which combines with the tube to form a restricted passage means in the form of a fixed size bore extending through the restrictor and having a predetermined flow rate therethrough, said tube being distortable by application of a force to such force concentrating section of the outer surface of the tube to temporarily form a flush passage in the valve having a substantially faster flow rate during the application of such force, which tube is adapted to close the flush passage upon removal of such force from the force concentrating section.

4,464,180

COMPOSITIONS AND METHOD FOR DYEING OR PRINTING WITH DISPERSE DYES

Hans-Peter Baumann, Ettingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

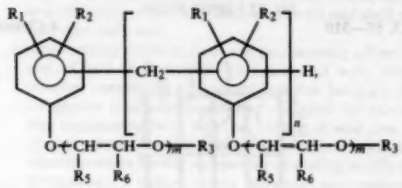
Filed Dec. 23, 1982, Ser. No. 452,461

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1982, 3200003; May 3, 1982, 3216462; Jul. 12, 1982, 3226053

Int. Cl.³ D06P *1/56*; C07C *41/18*; C07F *9/09*

U.S. Cl. 8—557 25 Claims

1. A method for dyeing or printing a textile substrate comprising treating said substrate with a dyebath, padding liquor or printing paste containing a disperse dye, a dyeing assistant and, as an emulsifying agent for the dyeing assistant, a compound or mixture of compounds of formula (I)



(I)

wherein

each R_1, independently, is C_{4-14}alkyl,

each R_2, independently, is hydrogen or C_{1-10}alkyl, with the proviso that the sum of the carbon atoms present in R_1 and R_2 borne by the same phenyl ring is from 6 to 18,

the R_3's are hydrogen, $—SO_3R_4'$ or $—CH_2CO_2R_4'$, with the proviso that an average of 0.5 to n/2 R_3's are $—SO_3R_4'$ or $—CH_2CO_2R_4'$,

each R_4' independently, is hydrogen, sodium, potassium, ammonium, or one calcium or magnesium equivalent,

either R_5 and R_6 are both hydrogen in each unit —CHR_5—CHR_6— or in, on average, up to 60% of the units —CHR_5—CHR_6— one of R_5 and R_6 is methyl and the other is hydrogen and in the remaining units —CHR_5—CHR_6— both of R_5 and R_6 are hydrogen,

each m, independently, is an integer from 4 to 20, and

n is an integer from 1 to 9.

4,464,181

MIXTURES OF BENZISOTHIAZOLE MONO-AZO DYES FOR CELLULOSE ACETATE

Helmut Degen, Frankenthal; Johannes P. Dix, Neuhofen; Norbert Grund; Guenter Hansen, both of Ludwigshafen, and Reinhold Krallmann, Weisenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

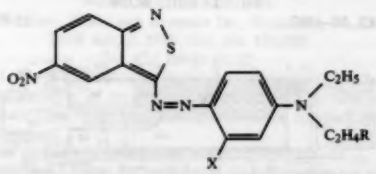
Filed Jan. 11, 1983, Ser. No. 457,223

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1982, 3205044

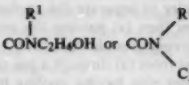
Int. Cl.³ C09B *29/00*

U.S. Cl. 8—639 3 Claims

1. A dye mixture for the dyeing of cellulose acetate esters, which comprises: an admixture of two dyes of the formula:



in a ratio of from 20:80 to 80:20, wherein X is hydrogen, methyl or chlorine, and R is a radical of the formula: OR^1, $OCOCH_3$, $OCOC_2H_5$,



said radical R^1 being hydrogen or C_1–C_4 alkyl.

4,464,182

GLYCOL ESTER FLOW IMPROVER ADDITIVE FOR DISTILLATE FUELS

Robert D. Tack, Abingdon; Kenneth Lewtas, Wantage, and John R. Brazier, Oxford, all of United Kingdom, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 17, 1982, Ser. No. 359,022

Claims priority, application United Kingdom, Mar. 31, 1981, 8110081; Nov. 20, 1981, 8135071

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—62 25 Claims

1. A distillate fuel oil containing 0.001 to 0.5 wt% of a flow improver being a polyoxyalkylene ester, ether, ester/ether or mixtures thereof which contain at least two C_{10} to C_{30} linear saturated alkyl groups and a polyoxyalkylene glycol of molecular weight in the range of about 100 to 5000 the alkylene group of said polyoxyalkylene glycol containing from 1 to 4 carbon atoms.

4,464,183

HEAT RECOVERY PROCESS IN COAL GASIFICATION

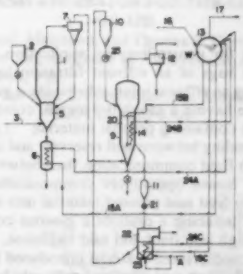
Kenji Arisaki, Kure, Japan, assignor to Babcock-Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 228,775, Jan. 27, 1981, abandoned. This application May 9, 1983, Ser. No. 492,638

Claims priority, application Japan, Jan. 29, 1980, 55-8296; Jan. 29, 1980, 55-8297; Jan. 29, 1980, 55-8298; Jan. 29, 1980, 55-8299; Jan. 29, 1980, 55-8300

Int. Cl.³ C10J *3/84*

U.S. Cl. 48—210 7 Claims



1. A process for the recovery of heat in coal gasification which comprises:

generating gas in a coal gasification furnace

providing a fluidized bed cooler containing fluidizing medium;

introducing the gas as a gas flow into the fluidized bed cooler, thereby fluidizing the medium and heating it;

providing heat transfer tubes disposed parallel to the direction of the gas flow, said heat transfer tubes having cooling medium passing therethrough;

recovering the heat of the gas in a fluidized bed cooler as heated cooling medium;

contacting the parallel tubes with the fluidizing medium, thereby cleaning the parallel tubes;

adhering unnecessary substances including tar in the gas onto the fluidizing medium; and

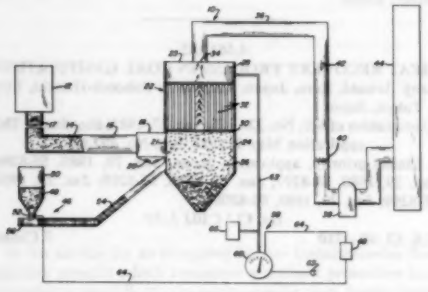
reducing the flow rate of the cooled gas at the top of the fluidized bed cooler to separate the cooled gas from the fluidizing medium then (a) passing the cooled separated gas through a moving granular bed filter to remove dust; (b) passing the gas from (a) through a gas cooler provided with a heat transfer pipe having cooling medium passing therethrough; (c) passing the gas from (b) through a gas scrubber; and (d) recovering the heat of the gas from (b) and (c) and wherein the cooling medium is water, the heat of the generated gas is recovered in the form of high pressure steam through the heat transfer tubes in the fluidized bed cooler, the waste heat in the gas cooler and scrubber is recovered in the forms of medium pressure steam and low pressure steam, respectively.

4,464,184

APPARATUS AND METHOD FOR THE CONTROL OF THE PRECOATING OF AN EFFLUENT FILTRATION BAGHOUSE UTILIZING CLEAN SIDE PRESSURE MEASUREMENT

Thomas J. Cera, North Township, Lake County, and Charles A. Price, Portage, both of Ind., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 22, 1982, Ser. No. 443,409
Int. Cl.³ B01D *46/02, 46/42*
U.S. Cl. 55—21 **11 Claims**



1. Apparatus for controlling the application of a precoat material to the bags of an effluent filtration baghouse, said baghouse having an effluent input side having a gas inlet means and a clean side having a gas outlet means, comprising:

a. a reservoir containing precoat material;

b. a duct extending between said reservoir and said baghouse to establish fluid communication therebetween;

c. a feeding means operatively communicating with said reservoir to feed said precoat material into said duct;

d. means for inducing a draft of a gaseous conveying medium through said duct and said baghouse, respectively, to convey said precoat material introduced into said precoat duct through said duct and onto said bags;

e. control apparatus having means for sensing the pressure on said clean side of the baghouse and for producing an output signal having intensity in proportion to the measured pressure and having regulating means operatively connected to said sensing means and said feeding means to halt the feed of precoat material by said feeding means into said duct upon the receipt of an output signal of intensity below a predetermined level and to allow the feed of precoat material upon the receipt of an output signal of intensity above said predetermined level.

7. Method for controlling the application of a precoat material to the bags of an effluent filtration baghouse which has effluent input and clean sides, comprising the steps of:

a. feeding said precoat material from a reservoir into a precoat material duct extending between said reservoir and said baghouse;

b. inducing a draft of a gas conveying medium through said duct and into said baghouse to convey said precoat material through said duct and onto said bags;

c. measuring the pressure on the clean side of said baghouse; and,

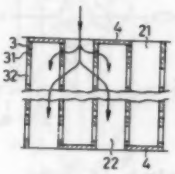
d. controlling the feeding of said precoat material into said duct so as to halt said feeding upon the measurement of a pressure below a predetermined level.

4,464,185

EXHAUST GAS FILTER

Masahiro Tomita, Anjo, and Toshiyuki Tsukao, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 3, 1982, Ser. No. 354,431
Claims priority, application Japan, Mar. 7, 1981, 56-32847; Oct. 20, 1981, 56-168213
Int. Cl.³ B01D *39/20*
U.S. Cl. 55—310 **4 Claims**



1. An exhaust gas filter for collecting carbon particles in the exhaust gases discharged from internal combustion engines, comprising:

a ceramic monolith having grid-shaped separator walls defining a large number of parallel exhaust gas passages, the cross sectional area of said passages being substantially the same;

said separator walls having a large number of minute pores;

said exhaust gas passages being composed of inlet passages which are open at one end of said filter and are closed at the other end thereof by cover means, and outlet passages which are closed by cover means at said one end of said filter and are open at said the other end thereof;

said inlet passages being communicated with said outlet passages through said minute pores of said separator walls; and

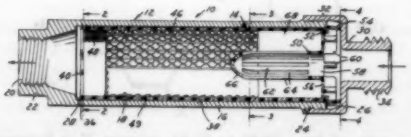
said separator walls further having a large number of exhaust gas blowing pores of a diameter not less than 100μ which diameter is larger than said minute pores and the total volume of said blowing pores is 1 to 20% of the total volume of all of said pores, whereby one portion of the exhaust gases enterting said inlet passages blows through said blowing pores without passing through said minute pores formed in said separator walls.

4,464,186

PNEUMATIC FILTER AND LIQUID EVAPORATOR

David O. Mann, Marshall, Mich., assignor to La-Man Corporation, Hamilton, Ind.

Filed Feb. 9, 1983, Ser. No. 465,296
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—387 **12 Claims**



1. A disposable cartridge assembly adapted for replaceable

insertion into a pneumatic liquid evaporator housing which includes a case having a cylindrical bore with a first fluid port at one axial end of said bore and an open second end remote from said first fluid port and surrounded by an axially outwardly facing end surface, and a cap including a second fluid port removably secured to said casing over said open end, said second fluid port being predesignated a fluid entrance port and the first being predesignated a fluid exit port, said disposable filter cartridge assembly comprising

a hollow cylindrical shell having an imperforate side wall and an integral end wall with at least one opening extending axially therethrough, said shell side wall having a diameter and length adapted to be received within said bore such that said end wall is disposed adjacent to said first fluid port,

a plug of water absorbent material disposed within said shell and extending across said shell so as to fill said shell within said side wall, and

an end member received over and permanently affixed to an end of said shell remote from said end wall, said end member comprising a peripheral portion having a diameter greater than said diameter of said shell for axial abutting engagement with said end surface of said case and a central portion integral with said peripheral portion, said central portion having an opening extending axially therethrough and a hollow sleeve integrally surrounding said opening and projecting into said shell, said sleeve having a plurality of apertures extending radially therethrough for directing fluid radially into said shell,

said plug of water absorbent material having an axial dimension which is less than said length of said shell, said sleeve having an end which engages said plug and holds said plug against said shell end wall, such that a portion of the interior of said shell immediately adjacent to said end member is open,

said cartridge assembly, including said shell and said end member, being adapted to be inserted into said case only from a direction which places said shell end wall adjacent to said first fluid port and said end member adjacent to said cap with second fluid port.

7. A pneumatic liquid evaporator and filter comprising an elongated hollow shell having an imperforate side wall and an integral end wall with at least one through opening,

an end cap received over an end of said shell remote from said end wall and permanently affixed thereto so as to form a cavity within said shell between said end wall and said end cap,

said end cap comprising a peripheral portion sealingly affixed to said shell, a central portion with a through opening, and a hollow projection integrally surrounding said opening and projecting into said cavity, with a plurality of apertures being formed in said projection for admitting fluid into said cavity, and

a plug of water absorbent material filling said cavity adjacent to said shell end wall and extending to adjacent said projection, said projection urging said plug against said end wall such that a portion of said cavity adjacent said end cap is open.

4,464,187

NESTING AIR FILTERS

Eli J. Kershaw, 2350 Loch Braemar Dr., Richmond, Va. 23235

Filed Apr. 3, 1980, Ser. No. 136,909

Int. Cl.³ B01D *46/10*

U.S. Cl. 55—501 **8 Claims**

1. An air filter of rectangular shape adapted to nest with another air filter of the same configuration in a compact space, comprising:

a filter element of fibrous material;

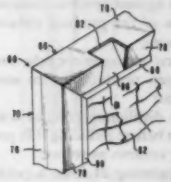
a paperboard frame for supporting said filter element at its marginal edges;

said frame being formed as a trough in cross section and arranged to form a closed, rectangular configuration surrounding said filter element to receive said marginal edges of said filter element in said trough;

said frame including an outer wall and a pair of inclined side walls sloping toward each other to receive said filter element therebetween;

each of said side walls terminating in a flange disposed substantially at right angles to said outer wall, said flanges being secured together with said filler element compressed therebetween to hold said frame and said filter element together;

said frame including a set of recesses formed at positions adjacent to diagonally opposite corners of said frame, each of said recesses comprising a partially cutaway por-



tion of said frame extending into said outer wall and one of said side walls of said frame, said flange of said one side wall remaining intact therewith and secured to said flange of said other side wall adjacent to said recess to maintain the rigidity of said frame, each recess being shaped to receive the frame of another air filter of the same rectangular shape with the filters arranged in an overlapping, laterally offset relationship to allow said filters to nest together in a compact space, and

each cutaway portion of said filter frame defining a flap integral with said frame and located in each recess for covering the marginal edge of said filter element located adjacent to each recess.

4,464,188

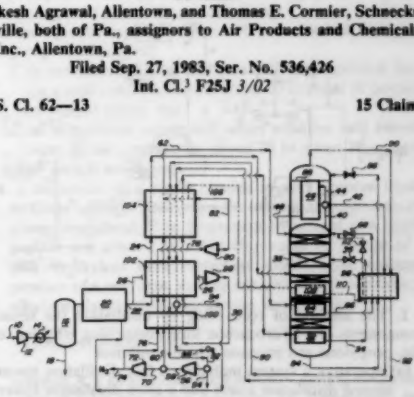
PROCESS AND APPARATUS FOR THE SEPARATION OF AIR

Rakesh Agrawal, Allentown, and Thomas E. Cormier, Schnecksville, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 27, 1983, Ser. No. 536,426

Int. Cl.³ F25J *3/02*

U.S. Cl. 62—13 **15 Claims**



15. A process for the separation of air by cryogenic distillation of the air in a distillation column comprising the steps of:

(a) compressing a feed air stream to an elevated pressure and aftercooling the pressurized air stream;

(b) removing water and carbon dioxide from the cooled pressurized air stream;

(c) splitting the feed air stream into a sidestream and a remaining stream;

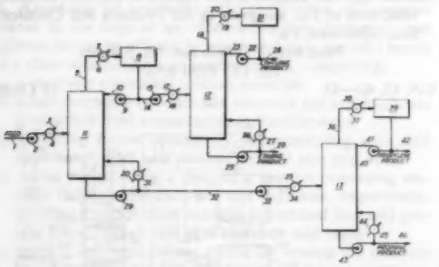
(d) cooling the remaining stream in heat exchange against other process streams before introducing it into a distillation column;
(e) compressing the sidestream and cooling it in heat exchange against process streams;
(f) reboiling the distillation column with the compressed sidestream before reducing the pressure of the sidestream and introducing it into the column;
(g) separating a nitrogen product stream and an oxygen-enriched stream from said distillation column;
(h) condensing a portion of the nitrogen product stream against the oxygen-enriched stream and returning it to the column as reflux;
(i) rewarming the remaining nitrogen product stream by heat exchange against process streams and compressing at least a portion of the product stream to an intermediate elevated pressure;
(j) splitting a first nitrogen recycle stream from the compressed nitrogen product stream and cooling it against process streams;
(k) reboiling the distillation column with said first nitrogen recycle stream before reducing it in pressure and introducing it into the column as reflux;
(l) further compressing at least a portion of the nitrogen product stream and splitting a second nitrogen recycle from the nitrogen product stream;
(m) expanding the second nitrogen recycle stream in an expander to lower temperature and pressure;
(n) reboiling the distillation column with said second nitrogen recycle stream separately from said first nitrogen recycle stream before reducing it in pressure and introducing it into the column as reflux.

4,464,189

FRACTIONAL DISTILLATION OF C_2/C_3 HYDROCARBONS AT OPTIMUM PRESSURES

Daniel W. Tedder, Marietta, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Division of Ser. No. 299,623, Sep. 4, 1981, abandoned. This application Apr. 5, 1982, Ser. No. 385,576
Int. Cl.³ F25J 3/02
U.S. Cl. 62—24 **2 Claims**



1. The method of recovering by distillation the separate components of a hydrocarbon fluid comprising ethylene, ethane, propylene and propane which comprises:
(a) operating a system including a first distillation tower, a second distillation tower and a third distillation tower in which each tower receives a single feed and produces two effluents and wherein the pressure of each tower is within ±15 psia of the pressure calculated from formulae:

$$\log_e(P^*) = 2.677 - 309.4/T_{FB} + 1147.6/T_{\phi B} + 1087.4/-T_{BD}$$

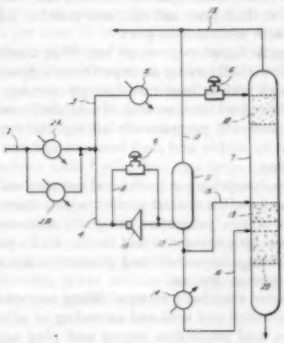
wherein:
P^* = the pressure of each tower in psia
T_{FB} = tower feed mixture bubble point temperature (°R) evaluated at 485 psia
$T_{\phi B}$ = tower overhead product mixture bubble point temperature (°R) evaluated at 485 psia
T_{BD} = tower bottom product mixture dew point temperature (°R) evaluated at 485 psia;
(b) feeding said hydrocarbon fluid to said first distillation tower;
(c) separating ethylene and ethane as an overhead from a propylene and propane bottom in said first distillation tower at from about 400 psia to about 600 psia;
(d) directing said ethylene and ethane overhead from the first distillation tower into said second distillation tower;
(e) separating said ethane and ethylene as an ethylene overhead and an ethane bottom in said second distillation tower at from about 600 psia to about 700 psia;
(f) directing said propylene and propane bottom from the first distillation tower into said third distillation tower;
(g) separating said propylene and propane into a propylene overhead and a propane bottom in said third distillation tower at from about 280 psia to about 300 psia;
(h) directing hot ethylene reactor products through a reactor quench tower system heat exchanger;
(i) directing fluid through said heat exchanger for heating thereof; and
(j) circulating the heated fluid through the reboiler of said third distillation tower for the purpose of reheating the propylene propane mixture.

4,464,190

HYDROCARBON GAS PROCESS

Jerry G. Gulsby, Kingwood, Tex., assignor to Gulsby Engineering, Inc., Tex.

Filed Aug. 18, 1982, Ser. No. 409,314
Int. Cl.³ F25J 3/02
U.S. Cl. 62—24 **5 Claims**



1. In a process for the recovery of components of volatile gas containing methane and heavier components by processing said gas through a demethanizer column, the improvement comprising: eliminating the requirement of pumps in said process by, introducing a stream of feed gas under pressure into a heat exchange unit to lower the temperature of said gas stream, dividing the stream into two streams, the first of said two streams being primarily vapors, which are again cooled by passing same through a heat exchanger, and then through a controlled expansion valve and into the top of the demethanizer column, directing said second stream through an expansion means, lowering the pressure and temperature and then through a divider, separating the vapors and liquid, discharging the vapors into a discharge conduit, and dividing the liquid into two streams, one of which is fed into the demethanizer column at the midway point, and the other stream passing through a heat exchanger unit to raise the temperature of the

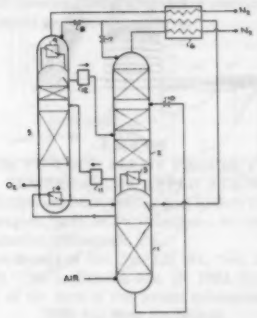
fluid and then feeding same into the demethanizer column at a feed point beneath the midway feed point.

4,464,191

CRYOGENIC GAS SEPARATION WITH LIQUID EXCHANGING COLUMNS

Donald C. Erickson, 1704 S. Harbor La., Annapolis, Md. 21401

Filed Sep. 29, 1982, Ser. No. 427,163
Int. Cl.³ F25J *3/02*
U.S. Cl. 62—31 **7 Claims**



1. A subambient multi-component gas distillation process, comprising:

rectifying said multi-component gas to provide a substantially pure first component overhead liquid and a liquid bottom mixture enriched in a second component and a source of reboil;

providing a first and second low pressure column;

providing reboil to said first and second low pressure columns from said source;

feeding said liquid bottom mixture to said first LP columns;

feeding the bottom liquid from said first column to said second column;

providing reflux to said second LP column by indirect heat exchange with at least part of said substantially pure first component overhead liquid;

feeding the overhead from said second LP column to said first LP column;

withdrawing a substantially pure gaseous first component from the overhead of said LP column;

withdrawing a substantially pure fluid second component from the bottom of said second LP column.

6. The apparatus according to claim **1** further comprising means to supply air which has been pressurized and cooled to near its dewpoint as the mixture, and wherein N_2 is the more volatile fraction.

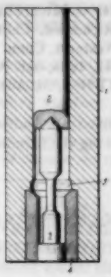
4,464,192

MOLDING PROCESS FOR FIBER REINFORCED GLASS MATRIX COMPOSITE ARTICLES

George K. Layden, Wethersfield, and Karl M. Prewo, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 25, 1982, Ser. No. 381,805
Int. Cl.³ C03C *25/00*
U.S. Cl. 65—18.1 **3 Claims**

1. A method of forming a fiber reinforced glass or glass-ceramic matrix composite, particularly adapted to forming such composite in complex shapes, comprising mixing high temperature stable reinforcing graphite, alumina, silicon nitride, or silicon carbide chopped fibers less than 0.75 inch in length with high silica content glass, borosilicate glass, or aluminosilicate glass or glass-ceramic, a polymeric binder, and a carrier liquid; drying the mixture to reduce the carrier liquid content to less than about 25% of original volume; cold pressing the dried mixture to less than half of its original volume; heating the cold pressed mixture to evaporate the remainder of the carrier liquid and decompose and remove the polymeric binder; hot pressing the thus consolidated mixture to a billet of predetermind density; heating the billet to a temperature above



the softening point of the matrix; injecting the heat softened billet into a preheated mold of predetermined shape; allowing the mold to cool to a temperature below the strain point of the glass; and removing the molded part having fiber orientation and strength in three dimensions from the mold.

4,464,193

ANIONIC BIOCIDE EMULSIONS IN AQUEOUS SOLUTIONS OF STRONGLY IONIZABLE SALTS

Thomas M. Kaneko, Trenton; Daniel R. Dutton, and Bongsub Kim, both of Grosse Ile, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 122,209, Feb. 19, 1980. This application Aug. 3, 1981, Ser. No. 289,715
Int. Cl.³ A01N *59/00*
U.S. Cl. 71—83 **12 Claims**

1. A highly stable mixture of a liquid fertilizer solution and an aqueous dispersion of a liquid biocide, said composition being adapted to the application of said composition to plants by spraying, said composition comprising:

A. an aqueous liquid fertilizer solution selected from the group consisting of

1. an ammonium nitrate and urea and water solution having a total concentration of about 20 to about 50 percent by weight solids, and

2. an ammonium nitrate and water solution, said ammonium nitrate constituting about 20 to about 50 percent by weight solids, and

B. a dispersion of a liquid biocide in said aqueous liquid fertilizer solution made using the emulsifiable concentrate comprising about 90 to 99 percent by weight of a liquid biocide and about 1 to about 10 percent by weight of a polyoxyalkylene ester surfactant which is the reaction product of a polybasic acid or anhydride with a polyoxyalkylene glycol ethoxylate having the formula

$$Y[(A)_m—(C_2H_4O)_m—H]_x$$

wherein A is an alkylene oxide having 4 carbon atoms and selected from the group consisting of oxybutylene, the residue of tetrahydrofuran, and mixtures thereof; Y is an initiator having up to 20 carbon atoms containing only the elements carbon, hydrogen, oxygen and nitrogen and x is an integer of at least 2, n is an integer such that the molecular weight is about 1000 to about 2500, m is an integer such that the oxyethylene content of the entire compound, mx oxyethylene groups, constitutes about 20 to about 80 percent by weight of the total oxyalkylene content or said polyoxyalkylene ester surfactant and at least one anionic

alkylaromatic sulphur- or phosphorus-containing ester surfactant having an HLB of at least 15.

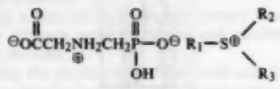
4,464,194

MIXED ALKYLSULFONIUM SALTS OF N-PHOSPHONOMETHYLGLYCINE

Michael P. Prisbylla, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed May 12, 1983, Ser. No. 493,836
Int. Cl.³ C07F 9/38; A01N 57/00
U.S. Cl. 71—87 **7 Claims**

1. As compounds, mixed alkylsulfonium salts of N-phosphonomethylglycine having the formula



wherein R^1 is selected from the group consisting of long-chain saturated or unsaturated alkyl groups having from 12 to 20 carbon atoms and R^2 and R_3 are the same or different and are selected from the group consisting of lower alkyl having from 1–3 carbon atoms.

4,464,195

HERBICIDAL AGENTS BASED ON N-(3,4-DICHLOROPHENYL)-N'METHOXY-N'-METHYLUREA AND BENZOTHIADIAZINONE DIOXIDES

Ingo Kroeger, Mountain Lakes, N.J., and Bruno Wuerzer, Otterstadt, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 5, 1982, Ser. No. 346,095
Int. Cl.³ A01N 43/32
U.S. Cl. 71—91 **1 Claim**

1. A process for combating the growth of unwanted Amaranthus spp. plants in soybeans, wherein the leaves of the Aramanthus ssp. plants and soybean plants are treated with a herbicidally effective amount of a herbicidal agent containing a composition of 3-isopropyl-1H-2,1,3-benzothiadiazin-4(3H)-one-2,2-dioxide or a salt thereof and N-(3,4-dichlorophenyl)-N'-methylurea, the weight ratio of benzothiadiazinone dioxide of the formula I to urea being from 1:0.05 to 1:0.2.

4,464,196

ACICULAR FERROMAGNETIC METAL PARTICLES

James E. French, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 24, 1983, Ser. No. 526,176
Int. Cl.³ B22F 9/26; H01F 1/06
U.S. Cl. 75—0.5 AA **4 Claims**

1. Acicular ferromagnetic metallic particles consisting essentially of iron and having an average diameter of 0.03 to 0.1 micron, a length to diameter ratio from about 5/1 to about 13/1, a specific surface area by the BET nitrogen method within the range of 20 to 45 m^2/gram and a coercivity in oersteds equal to at least the value defined by the equation

$$\text{coercivity} = 1300 + 50\,(S\text{-}20)$$

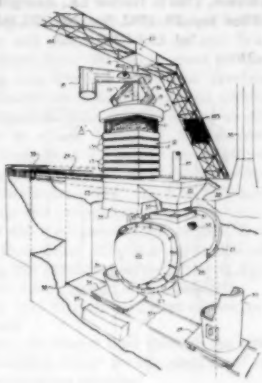
where S is the specific surface area and is 20 to 30 m^2/g, or a coercivity greater than 1800 oersteds when the specific surface area is greater than 30 m^2/g, said coercivity being measured on dry, stable powder at a field strength of 10,000 oersteds and a packing density of 1.0 gram/cm^3.

4,464,197

METHOD FOR MAKING IRON BY INDUCTION HEATING

Albert Calderon, 1065 Melrose St., Bowling Green, Ohio 43402

Filed Mar. 17, 1980, Ser. No. 131,137
Int. Cl.³ C21B 13/12
U.S. Cl. 75—11 **28 Claims**



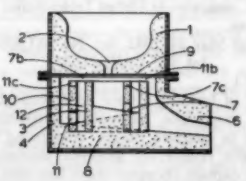
1. A method of reducing iron oxide comprising the steps of charging iron oxide and solid carbonaceous material into a plurality of compartments each of which comprises a tubular wall formed of a material which is adaptable to being heated by induction and defining a reducing space therein, said plurality of compartments commonly sharing an induction coil means which surrounds the tubular walls of said plurality of compartments and said induction coil means does not individually surround the tubular wall of any of said compartments, heating said tubular walls of said plurality of said compartments by said induction coil means and transferring heat by conduction from the tubular walls to the iron oxide and solid carbonaceous material therein to cause the metallization of the iron oxide by reaction of the iron oxide with the reducing agents that are released from the solid carbonaceous material upon the heating thereof within each compartment, and discharging metallized iron from said plurality of compartments.

4,464,198

APPARATUS AND PROCESS FOR THE TREATMENT OF MOLTEN METAL

Geoffrey Mannion, Horsham, and Patrick V. Palmer, Hove, both of England, assignors to The International Meehanite Metal Company Limited, Surrey, England

Filed Jan. 17, 1983, Ser. No. 458,194
Claims priority, application United Kingdom, Jan. 20, 1982, 8201538
Int. Cl.³ C22C 33/08
U.S. Cl. 75—130 R **12 Claims**



1. An apparatus for the treatment of molten metal, said apparatus comprising:

(a) an additive container means for receiving molten metal and holding an additive to be added to the molten metal upon contact between the molten metal and the additive, said additive container means including at least one aperture in the top thereof;

(b) a pouring bush for receiving molten metal, said pouring bush being positioned such that it opens into said additive container means; and

(c) housing means for housing said additive container means and for containing the molten metal after it exits from said additive container means through said at least one aperture, said housing means preventing contact between the molten metal and the atmosphere.

4,464,199

ALUMINUM POWDER ALLOY PRODUCT FOR HIGH TEMPERATURE APPLICATION

Gregory J. Hildeman, Murrysville, and Robert E. Sanders, Jr., New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 323,181, Nov. 20, 1981, Pat. No. 4,379,719. This application Jan. 20, 1983, Ser. No. 459,287
The portion of the term of this patent subsequent to Apr. 12, 2000, has been disclaimed.
Int. Cl.³ B22F 3/14; C22C 21/20
U.S. Cl. 75—249 26 Claims

1. A method of producing an improved aluminum article having high strength at elevated temperatures, comprising the steps:

(a) providing aluminum alloy particulate consisting essentially of 4 to 15% iron, 1 to 12% rare earth metal, balance aluminum and impurities and incidental elements, the weight ratio of iron to rare earth metal falling within the range of 0.5 to 5:1; and

(b) compacting said powder under vacuum at a pressure of one torr or less and elevated temperature conditions wherein said powders are compacted to at least 95% of full density at a temperature greater than 650° F.

4,464,200

PLASTIC SOIL STABILIZER COMPOSITION AND METHOD OF USE

Henry H. Duval, Dallas, Tex., assignor to William B. Ellis, Dallas, Tex., a part interest

Continuation of Ser. No. 202,118, Oct. 30, 1980, abandoned, which is a continuation-in-part of Ser. No. 113,057, Jan. 17, 1980, abandoned. This application May 21, 1982, Ser. No. 380,618
Int. Cl.³ C04B 7/02
U.S. Cl. 106—90 3 Claims

1. A method of stabilizing plastic soils comprising the steps of:

mixing with the plastic soil a composition comprising about 50 weight percent Portland cement, about 49.5 percent weight filler and about 0.5 weight percent retarding agent;

maintaining the plastic soil and composition undisturbed for a period sufficient to permit the lime in the composition to react with the plastic soil to reduce the plasticity index of the plastic soil;

remixing the plastic soil with the composition therein and shaping it to the desired grade; and

curing the remixed plastic soil and composition into a hardened, stable mass.

4,464,201

PROCESS FOR PRODUCING CEMENT AND CEMENT OBTAINED BY MEANS OF THIS PROCESS

Guy S. Pairon, Auderghem, Belgium, assignor to S.A. Cimenteries C.B.R. Cementbedrijven N.V., Watermael-Boitsfort, Belgium

Filed Dec. 8, 1982, Ser. No. 447,937
Claims priority, application Belgium, Dec. 10, 1981, 206801
Int. Cl.³ C04B 7/35, 7/52
U.S. Cl. 106—90 9 Claims

1. A process for producing cement adapted for use in preparing an injection grout for prestressed concrete sheathes, said process comprising grinding together, at a temperature lower than 90° C., Portland clinker which is free from any corrosive ions for steel, gypsum, an anhydrous water reducing additive and an also an anhydrous cement set retarding agent.

4,464,202

AQUEOUS ADHESIVE COMPOSITION USEFUL FOR LABELING BOTTLES

Johannes Andres, Düsseldorf; Rainer Hasenkamp, and Heinrich Merkel, both of Erkrath, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Fed. Rep. of Germany

Filed Nov. 8, 1982, Ser. No. 440,074
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1981, 3146364; Feb. 13, 1982, 3205210; Feb. 13, 1982, 3205211
Int. Cl.³ C08L 89/00
U.S. Cl. 106—139 28 Claims

1. An aqueous composition for mechanical labeling based upon starch derivatives and having a content of flow-regulating additives and, optionally, other customery additives, which comprises:

(a) at least one hydroxyalkyl ether of oxidized starch with a mean degree of substitution (MS) of ≦0.2, together with

(b) at least one polymer dissolved in the aqueous phase, the polymer being selected from the group consisting of water-soluble cellulose derivatives and water-soluble starch derivatives different from component (a).

4,464,203

HIGHLY CONCENTRATED, DUST-FREE, SOLID AND READILY DISPERSIBLE PIGMENT FORMULATIONS AND THEIR USE

Horst Belde, Ludwigshafen; Eduard Hartmann, Limburgerhof, and Ewald Daubach, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 8, 1982, Ser. No. 448,049
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1981, 3151753
Int. Cl.³ C09C 3/08
U.S. Cl. 106—308 N 18 Claims

1. A highly concentrated, dust-free, solid pigment formulation, consisting essentially of:

(a) from 70 to 95% by weight of at least one finely divided pigment, and

(b) from 5 to 30% by weight of at least one block copolymer surfactant obtained by reacting an amine of the formula

$$H_2N\text{-}\left(R\text{-}\underset{\displaystyle R^1}{\underset{|}{N}}\text{-}\right)_n\text{-}H,$$

where R is C_2–C_6-alkylene, R^1 is H or C_1–C_4-alkyl and n is 1, 2, 3, 4 or 5, or R is 1,3-phenylene, 1,4-phenylene or 4,4'-diphenylenemethane, R^1 is H and n is 1, with propylene oxide and then reacting the product with ethylene oxide, said block copolymer possessing 20–45% by weight, based on the block copolymer, of ethylene oxide units and having a mean molecular weight of from 4,000 to 15,000, the percentages being based on (a+b).

4,464,204

ALKYLIDENATION OF FRUCTOSE WITH PERFLUORINATED ACID CATALYSTS

Carl W. Niekamp, Forsyth, and Martin Seidman, Decatur, both of Ill., assignors to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Nov. 29, 1982, Ser. No. 445,114
Int. Cl.³ C07H 1/06; C13D 3/14; C13K 11/00
U.S. Cl. 127—36 10 Claims

1. A method for converting an aqueous solution of a high dextrose and fructose content into a syrup of enriched fructose, said method comprising:

(a) providing an aqueous fructose and dextrose solution comprising at least 80% of dextrose plus fructose on a total dry syrup solids weight basis, wherein the weight ratio of fructose to dextrose ranges from about 1:2 to about 2:1;

(b) admixing the provided solution with an effective amount of at least one member selected from the group consisting of aldehyde, ketone and acetal to permit the catalytic conversion of a substantial portion of the fructose into an alkylidene fructose;

(c) converting a substantial portion of the fructose within the mixture to an alkylidene fructose by catalysis with perfluorinated acid exchange resin catalyst;

(d) precipitating a substantial portion of the dextrose from the converted mixture; and

(e) separating the precipitated dextrose from the converted mixture to provide a liquid portion of an enriched, alkylidene fructose content.

4,464,205

WROUGHT P/M PROCESSING FOR MASTER ALLOY POWDER

Prabhat Kumar; Ronald D. Rivers, both of Kokomo, Ind., and Anthony J. Hickl, Wyomissing, Pa., assignors to Cabot Corporation, Kokomo, Ind.

Filed Nov. 25, 1983, Ser. No. 555,314
Int. Cl.³ B22F 1/00, 3/16
U.S. Cl. 148—11.5 P 12 Claims

1. In a process for producing a wrought product having less than 0.015% carbon, which process includes the steps of: compacting metal powder; sintering metal powder; and hot working said sintered powder; the improvement comprising the steps of: comminuting metal powder to effect a reduction in particle size, at least 60% of the comminuted particles being capable of passing through a −270 mesh Tyler screen, said metal powder being an alloy of two or more constituents; blending said powder with a softer metal-bearing powder; heating said blended powder particles at an elevated temperature, said particles adhering and forming a mass during heating; crushing said mass of powder particles; cold-isostatically pressing said crushed mass of powder; sintering said powder in the absence of an encapsulating member under conditions which effect a reduction in the nitrogen, oxygen and carbon levels of the powder; and hot working said sintered powder into a wrought product.

4,464,206

WROUGHT P/M PROCESSING FOR PREALLOYED POWDER

Prabhat Kumar; Ronald D. Rivers, both of Kokomo, Ind., and Anthony J. Hickl, Wyomissing, Pa., assignors to Cabot Corporation, Kokomo, Ind.

Filed Nov. 25, 1983, Ser. No. 555,315
Int. Cl.³ B22F 1/00, 3/16
U.S. Cl. 148—11.5 P 10 Claims

1. In a process for producing a wrought product from metal powder, which process includes the steps of: compacting metal powder; sintering metal powder; and hot working said sintered powder; the improvement comprising the steps of: comminuting substantially noncompactible prealloyed metal powder so as to flatten the particles thereof; heating said comminuted particles of metal powder at an elevated temperature, said particles adhering and forming a mass during heating; crushing said mass of metal powder; compacting said crushed mass of metal powder; sintering said metal powder; and hot working said sintered powder into a wrought product, said wrought product having a chemistry which is substantially the same, with the exception of carbon and certain residuals, as the chemistry of the prealloyed powder.

4,464,207

DISPERSION STRENGTHENED FERRITIC STAINLESS STEEL

Lynn E. Kindlimann, Woodland Hills, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Aug. 14, 1978, Ser. No. 933,396
Int. Cl.³ C22C 38/28; C23C 11/16
U.S. Cl. 148—16.6 16 Claims

1. Light gage internally through-nitrided ferritic stainless steel modified to about 0.5–2.25% titanium content and about 0.03% carbon maximum and containing a dispersion of titanium nitride particles at an interparticle spacing of less than about 10 microns, said nitrided ferritic stainless steel having a room temperature tensile yield strength of at least 10,000 psi greater than said ferritic stainless steel without said modification and nitridation, a 1000° F. tensile yield strength of at least 10,000 psi greater than said ferritic stainless steel without said modification and nitridation, and a 1400° F. creep strength (1% creep under load in 100 hours) improvement of at least about 50% over said ferritic stainless steel without modification and nitridation, said comparative tensile yield strengths and creep strength improvements referring to materials subjected to the same heat treatment, and said nitrided ferritic stainless steel being essentially devoid of chromium nitrides and having a high temperature oxidation resistance comparable to the high temperature oxidation resistance of said ferritic steel without said modification and internal nitridation.

16. A method for internally through nitriding light gauge ferritic stainless steel to produce a through-nitrided ferritic stainless steel material having a room temperature tensile yield strength of at least 10,000 psi greater than said ferritic stainless steel without said internal nitridation, a 1000° F. tensile yield strength of at least 10,000 psi greater than said ferritic stainless steel without said internal nitridation, a 1400° F. creep strength (1% creep under load in 100 hours) improvement of at least about 50% over said ferritic stainless steel without said internal nitration, and having high temperature oxidation resistance comparable to such ferritic stainless steel before nitriding, comprising the steps of:

(a) treating said stainless steel with a source of atomic nitrogen in a non-oxidizing environment at a temperature in the range of 1500° F. to 1800° F. for a time sufficient to partially nitride the cross section of said material, and

(b) heating said partially nitrided material to a temperature below about 1800° F. in a non-oxidizing environment for a time sufficient to decompose substantially all of the chromium nitride formed during said partial nitriding step and combine the remaining unreacted titanium with the nitrogen which is releasd from the decomposition of said chromium nitride.

4,464,208

AMORPHOUS ALLOY FOR MAGNETIC HEAD

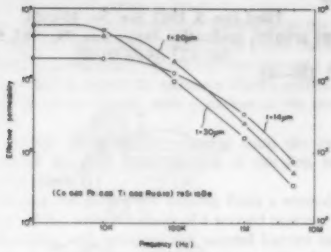
Hiroshi Tateishi, Zushi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 30, 1982, Ser. No. 454,545
Claims priority, application Japan, Jan. 8, 1982, 54-1542
Int. Cl.³ H01F 1/04
U.S. Cl. 148—31.55 14 Claims

1. An amorphous alloy for a magnetic head, which is of the formula:

$$(Co_{1-a-b-c}Fe_aRu_bTM_c)_{100-x-y}Si_xB_y$$

wherein TM is at least one selected from the group consisting of titanium(Ti), vanadium(V), chromium(Cr), manganese(Mn),



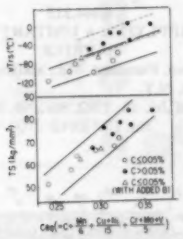
nickel(Ni), zirconium(Zr), niobium(Nb), molybdenum(Mo), hafnium(Hf), tantalum(Ta) and tungsten(W), "a", "b", "c", "x" and "y" are atomic concentrations ranging from 0.02 to 0.08, 0.07 to 0.2, 0 or 0.01 to 0.1, 0 to 20, and 4 to 9, respectively.

4,464,209

CLAD STEEL PIPE EXCELLENT IN CORROSION RESISTANCE AND LOW-TEMPERATURE TOUGHNESS AND METHOD FOR MANUFACTURING SAME

Tadaaki Taira; Junichiro Takehara; Yasuo Kobayashi, and Kazuyoshi Ume, all of Fukuyama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1983, Ser. No. 465,349
Claims priority, application Japan, Feb. 27, 1982, 57-31313
Int. Cl.³ B21C *37/06*; B32B *1/08*
U.S. Cl. 148—36 **16 Claims**



1. A clad steel pipe excellent in corrosion resistance and low-temperature toughness, which comprises a cladding sheet of high corrosion resistant steel and a substrate sheet of low-alloy high-strength steel,

characterized by:

said substrate sheet consisting essentially of:

carbon: from 0.002 to 0.050 wt. %,

silicon: from 0.05 to 0.80 wt. %,

manganese: from 0.80 to 2.20 wt. %,

niobium: from 0.01 to 0.10 wt. %,

aluminum: from 0.01 to 0.08 wt. %,

nitrogen: from 0.002 to 0.008 wt. %,

and,

the balance being iron and incidental impurities; and,

said cladding sheet being imparted high corrosion resistance and said substrate sheet being imparted high low-temperature toughness through a solution treatment applied under the following conditions:

heating temperature: from 900° to 1,150° C.

holding period: up to 15 minutes, and,

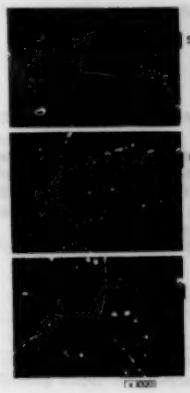
cooling rate: from 5° to 100° C./second.

4,464,210

NI-CR-W ALLOY HAVING IMPROVED HIGH TEMPERATURE FATIGUE STRENGTH AND METHOD OF PRODUCING THE SAME

Rikizo Watanabe, Yasugi, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jun. 17, 1982, Ser. No. 389,497
Claims priority, application Japan, Jun. 30, 1981, 56-100709
Int. Cl.³ C22F *1/10*; C22C *19/05*
U.S. Cl. 148—162 **8 Claims**



3. A method of producing an Ni-Cr-W alloy having an improved high temperature fatigue strength comprising the steps of: heating, for longer than 0.1 hour at a first temperature higher than 1280° C., an alloy consisting essentially of, by weight, less than 0.1% of C, 21 to 26% of Cr, 16 to 21% of W and more than 50% of Ni, to dissolve almost all precipitates into the austenite phase and to coarsen the austenite grains to larger than 100 μm in mean grain size; cooling the alloy to a temperature below 500° C. at a high cooling rate sufficient to avoid any substantial precipitation during the cooling; and reheating said alloy to a second temperature which is 30° to 200° C. lower than the first heating temperature for longer than 0.5 hour, thereby causing a preferential precipitation of primary solid solution of W of body-centered cubic crystal in the austenite grain boundary.

4,464,211

METHOD FOR SELECTIVE AREA GROWTH BY LIQUID PHASE EPITAXY

Ralph A. Logan, Morristown, and Won-Tien Tsang, New Providence, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 26, 1982, Ser. No. 382,402
Int. Cl.³ H01L *21/208*
U.S. Cl. 148—171 **7 Claims**

1. A method of fabricating a device comprising the step of selectively growing at least one epitaxial layer, said growing

step comprising the steps of contacting a first semiconductor material comprising at least one constituent and a second semiconductor material comprising at least two constituents with a growth solution; said growth solution comprising at least two constituents of said first and said second semiconductor materials; said materials being in nonequilibrium with said solution;

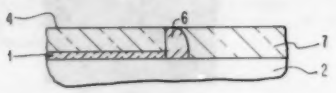
raising the temperature of said system followed by subsequent lowering of the temperature whereby growth selectively occurs on said first material.

4,464,212

METHOD FOR MAKING HIGH SHEET RESISTIVITY RESISTORS

Harsaran S. Bhatia, Wappingers Falls, and Jacob Riseman, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1982, Ser. No. 449,122
Int. Cl.³ H01L *21/225*
U.S. Cl. 148—187 **2 Claims**



1. The method of fabricating a first doped polycrystalline silicon resistor comprising:

providing a monocrystalline silicon semiconductor body;

forming a first insulator material layer upon a major surface of said body;

anisotropically etching said first layer, leaving a substantially vertical edge of said first layer where said resistor is to be formed;

forming a second layer of doped polycrystalline silicon material, having a different anisotropic etching characteristic as compared to said first layer, over said first layer;

anisotropically etching said second layer to substantially remove the horizontal portions of said second layer and leave the substantially vertical portion of said second layer on said edge of said first layer, thereby forming the body of said first resistor;

forming a third layer of said first insulator material over the resulting structure, said third layer being substantially coplanar with said vertical portion of said second layer; and

making electrical contact to the terminal portions of said first resistor body.

4,464,213

NOBLEIZATION OF BETA BRASS

John P. Nielsen, One Washington Square Village, New York, N.Y. 10012

Filed Sep. 30, 1982, Ser. No. 429,703
Int. Cl.³ C22C *9/04, 30/02*
U.S. Cl. 148—442 **3 Claims**

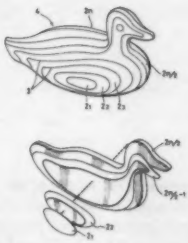
1. A tarnish resistant beta brass body-centered cubic structure alloy comprising copper; zinc and at least about 25% by weight of a noble metal selected from the class consisting of Au and Pd.

4,464,214

METHOD OF MAKING KITS FOR CARVING REPRODUCTION

Osamu Tsuchie, 5-5, Honcho 1-chome, Nakano-ku, Tokyo, Japan

Filed Jan. 3, 1983, Ser. No. 454,954
Claims priority, application Japan, Jan. 29, 1982, 57-11773
Int. Cl.³ A41G *00/00*
U.S. Cl. 156—61 **4 Claims**



1. A method of making a kit of component pieces of board to be assembled and joined together for carving reproduction, which comprises joining a given number of pieces of board having substantially the same thickness into a multilayer block with an adhesive readily soluble in a solvent, carving said block into an original figure, dissolving said adhesive away from said block with said solvent and thereby separating said block into contoured pieces of board, tracing the contours of said separate pieces on a drawing paper, and then blanking or otherwise cutting a set of reproduced pieces out of a board in accordance with said drawing.

4,464,215

PROCESS OF APPLYING A UNITARY CONSTRUCTION BARRIER

Joseph A. Cogliano, Pasadena, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Jul. 28, 1982, Ser. No. 402,749
Int. Cl.³ E04B *2/00*
U.S. Cl. 156—71 **11 Claims**

1. A process for forming a barrier construction on a structural surface comprising

(A) transporting barriers to a structural surface to be covered, each of said barriers comprising

(a) a porous, substantially planar structure having a first and a second major surface and edges defining the dimensions of the structure and said structure having a thickness of from about 0.25 inch to about 10 inches and

(b) a non-porous bituminous adhesive sheet formed from blends of bituminous material and natural or synthetic rubber or resin, said sheet having a thickness of at least 0.01 inch, a first and a second major surface and edges defining the dimensions of said adhesive sheet, wherein two of the sheet edges extend beyond, are each substantially parallel to an edge of the porous structure, respectively, and are in contact with each other at one corner section of said barrier, and wherein the first major surface of said adhesive sheet is in contact with and self-adhered to the substantially entire first major surface of the porous structure; and

(c) a first protective coating which is coextensive and

congruent with the extended portion of the first major surface of the adhesive sheet and a second protective coating which is coextensive and congruent with the second major surface of the adhesive sheet, each of said coatings being removable from and substantially non-adherent to said adhesive sheet.

(B) removing the second protective coating from the second major surface of the adhesive sheet of a first barrier;

(C) positioning and applying the first barrier onto a structural surface to cause the adhesive sheet's second major surface to be in contact with a portion of the structural surface;

(D) removing the protective coating from the extended portion of the first major surface of the first barrier's adhesive sheet;

(E) removing the protective coating from a second major surface of the adhesive sheet of a second barrier;

(F) positioning and applying the second barrier onto the structural surface adjacent to that of a previously applied barrier in a manner such that a portion of the second major surface of the adhesive sheet of the second barrier is superimposed on a portion of the extended first surface of the adhesive sheet of the previously applied barrier and the second barrier's porous structure is adjacent to the previously applied barrier porous structure; and

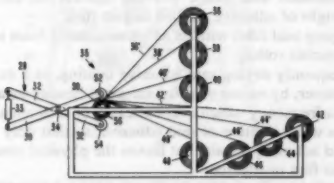
(G) repeating Steps (D), (E), and (F) until the structure surface is covered.

4,464,216

COMPOSITE NEGATOR SPRINGS

Richard J. Gardiner, Murray, Utah, assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 26, 1982, Ser. No. 362,204
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—162 **20 Claims**



1. A method of fabricating a coaxial composite spring having filamentary materials that spiral about a first rotational axis of said spring in a sheet of preformed resinous convolutes, said sheet being coilable about a second axis, parallel to said first axis, for energizing said spring, said method comprising:

providing a plurality of spooled sheets wherein a first of said sheets comprises hardenable resin and filamentary materials disposed angularly to a first sheet first axis in the plane of said first sheet and a second of said sheets is releasable from the hardened product of said hardenable resin;

fixing said first and second sheets relative to a precursor axis that becomes said first rotational axis after hardening of said hardenable resin such that an end portion of said first sheet adjacent said precursor axis is juxtaposed an end portion of said second sheet either atop the other with said first sheet first axis being parallel to said precursor axis;

causing remainder portions of said first and second sheets remotely located from said end portions and away from said precursor axis to unwind and wrap together on themselves under tension about said precursor axis such that a first sheet second axis in the plane of said first sheet and normal to said first sheet first axis sprials around said precursor axis substantially in a plane that is normal thereto; and

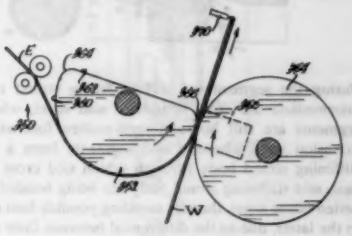
hardening said resin in the so wrapped sheets to provide said spring.

4,464,217

METHOD FOR EFFECTING SECURMENT OF ALTERNATING STRETCHED AND UNSTRETCHED ELASTIC RIBBON TO A MOVING WEB

William E. Dickover, Lyons; Ladislav J. Klasek, North Riverside, and Anthony Passafiume, Burbank, all of Ill., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed May 16, 1980, Ser. No. 150,515
Int. Cl.³ B32B *31/08*
U.S. Cl. 156—164 **12 Claims**



1. The method of securing an elastic member to a flexible web of material defining diaper components comprising the steps of:

(a) engaging a continuous strip of the elastic member with a rotating engaging member having an elastic member stretching first surface and an elastic member relaxing second surface, said first surface having a length greater than said second surface;

(b) gripping a first region of said elastic member and continuing to rotate said engaging member against said strip of elastic member causing said elastic member to elongate about said first surface to form a stretched segment, gripping a second region of said elastic member to maintain the stretched segment in the stretched condition and continuing to rotate said engaging member causing said elastic member to relax against said second surface to form an unstretched segment;

(c) moving said web along a path and feeding said segments along said path adjacent said web;

(d) securing said stretched segment to a predetermined portion of said web; and

(e) severing said web and said strip of elastic member generally transversely of said path whereby said unstretched segment imparts substantially no stretchable characteristic to said web and whereby said secured stretched segment contracts to gather the web of material to which it is secured for accommodating subsequent stretching.

4,464,218

METHOD FOR REINFORCING NET MATERIALS

Harmon W. Arnold; Galen B. Erwin, both of Carthage; John P. Gowing, Joplin, and David D. Mundell, Carthage, all of Mo., assignors to Flex-O-Lators, Inc., Carthage, Mo.

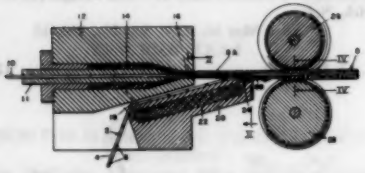
Filed Apr. 18, 1983, Ser. No. 485,870
Int. Cl.³ B29D *3/02*
U.S. Cl. 156—244.12 **4 Claims**

1. A method of reinforcing a netted fabric sheet consisting of spaced apart longitudinal and cross strands connected at their points of intersection, said sheet being formed of a thermoplastic material having a relatively high melting point, said method comprising the successive steps of:

a. extruding a stiffening strand of thermoplastic material in the form of a longitudinally divided separate segments,

through a pair of suitable extrusion dies, the material of said strand having a relatively low melting point as compared to that of said netted fabric sheet,

b. arranging said stiffening strand segments in closely adjacent relation to the respectively opposite sides of said netted sheet, intermediate and parallel to a pair of the longitudinal strands of said sheet and generally normally to the cross strands of said sheet, and



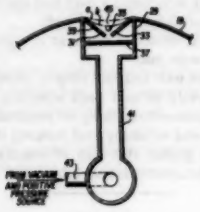
c. fusing the segments of said stiffening strand together intermediate the cross strands of said sheet, while said segments are still hot and semi-molten following said extrusion step, whereby said segments form a unitary stiffening strand body through which said cross strands pass, said stiffening strand body not being bonded to said netted fabric sheet, thereby avoiding possible heat damage to the latter, due to the differential between their melting points.

4,464,219

VACUUM SEAL BAR

Edward A. Colombo, and Gordon V. Sharps, Jr., both of Fairport, N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 28, 1983, Ser. No. 469,858
Int. Cl.³ B32B *31/18*
U.S. Cl. 156—251 **29 Claims**



1. A method for cutting and heat sealing a plastic film comprising the steps of:

heating a cutting and sealing wire to a first predetermined temperature;

conveying a plastic film to and over a sealing area, said sealing area overlying said cutting and sealing wire;

heating said sealing wire to a second predetermined temperature higher than the first; and,

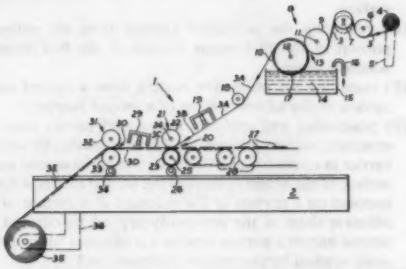
applying a first differential pressure to said film biasing it toward and into contact with said sealing wire during the time said wire is heated to said second predetermined temperature, causing said wire to cut and seal said plastic film.

4,464,220

METHOD AND APPARATUS FOR LAMINATING A DRIED ADHESIVE FILM TO A SUBSTRATE

Michael W. Beer, Chesterfield, England, assignor to Eurobond Coatings Limited, Nottingham, England

Filed Jul. 9, 1982, Ser. No. 396,735
Claims priority, application United Kingdom, May 28, 1982, 8215782
Int. Cl.³ B32B *31/12*
U.S. Cl. 156—273.3 **30 Claims**



1. A method of laminating a film to a substrate, comprising:

feeding said film to a coating station which comprises a pair of contra-rotatable rollers rotatable about parallel, horizontal axes with adjacent peripheries of said rollers located in closely spaced relationship to define a nip and with one of said rollers being a metal roller and the other of said rollers being compressible and having a portion of its periphery immersed in a bath of water based adhesive, and at least one of said rollers being adjustable in position with respect to the other said roller to adjust the nip dimension and hence provide control of the coating weight of adhesive applied to said film;

stripping said film, with its adhesive coating from said compressible roller;

subsequently drying said adhesive coating, in a contactless manner, by means of a first infra-red heating means tuned to a frequency which evaporates all, or substantially all, of the water content of said adhesive, so that only solids of said adhesive remain, but leaves the physical condition of said film unaffected;

feeding said film, with its "dry" adhesive coating past a second infra-red heating means, also tuned to a frequency that activates said solids of said adhesive that are adhering to said film, but leaves the physical condition of said film unaffected, such that said solids are remelted;

and thereafter passing said film to a laminating station comprising a pair of contra-rotatable pinch rollers rotatable about parallel, horizontal axes, with adjacent peripheries of said pinch rollers located in closely spaced, adjustable relationship so as to define a nip, said film being fed, in contact with the substrate to which it is to be laminated, through said pinch rollers nip, with the laminated product emerging from the other side of said pinch rollers nip.

2. A machine for laminating a film to a substrate, comprising a coating station, a pair of contra-rotatable rollers incorporated in said coating station, said rollers being rotatable about parallel, horizontal axes, with adjacent peripheries of said rollers located in closely spaced relationship and with one of said rollers being a metal roller and the other of said rollers being compressible, a bath of water based adhesive in which is immersable a portion of the periphery of the compressible roller, and at least one of said rollers adjustable in position with respect to the other of said rollers to adjust the nip dimension and hence provide control of the coating weight of adhesive applied to said film, means to strip said film, with its adhesive coating, from said compressible roller; a first infra-red heating means tuned to a frequency adapted to evaporate substantially

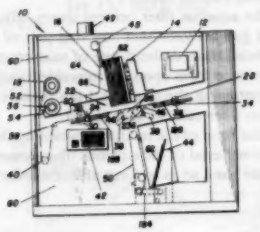
all of the water content of said adhesive so that only solids of said adhesive remain, but to leave the physical condition of said film unaffected, a second infra-red heating means also tuned to a frequency adapted to activate, by re-melting, said solids of the adhesive adhering to said film, but to leave the physical condition of said film unaffected; a laminating station, a pair of contra-rotatable pinch rollers incorporated in said laminating station, said pinch rollers being rotatable about parallel axes with adjacent peripheries of said pinch rollers located in closely spaced, adjustable relationship so as to define a nip, said film, in contact with the substrate to which it is to be laminated being feedable into said nip, with said pinch rollers squeezing said film and substrate together, to obtain intimate bonding, which grows in strength as the laminated product cools.

4,464,221

AUTOMATIC LAMINATOR

John L. Garber, Fenton, Mo., assignor to Dynachem Corporation, Tustin, Calif.

Filed Jan. 28, 1983, Ser. No. 461,806
Int. Cl.³ B32B *31/20*
U.S. Cl. 156—484 **20 Claims**



1. A laminator for applying photoresist dry film to the opposite faces of panels comprising,

supporting frame means providing a laminating station and a nip located substantially centrally with respect to said station,

means for releasably suspending each of successive predetermined lengths of photoresist dry film in said laminating station above said nip with said nip substantially midway the length of each of said lengths of film,

means for providing a supporting surface for holding a stack of panels in an upright position, said supporting surface being slanted slightly from the vertical direction so that the panels are stably supported and tend to stay in place,

pick-up means for picking up and holding successive ones of the panels in upright position in line with said nip as each of the successive lengths of film are suspended above said nip, and

means associated with said pick-up means for moving each of the successive panels down into engagement with the film and into said nip,

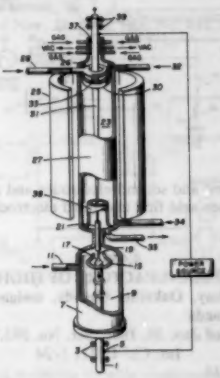
the direction of suspension of each of the successive lengths of film being slightly from the horizontal direction corresponding to the slant of said supporting surface whereby each panel engages the associated length of film at a substantially 90° angle during the downward movement thereof.

4,464,222

PROCESS FOR INCREASING SILICON THERMAL DECOMPOSITION DEPOSITION RATES FROM SILICON HALIDE-HYDROGEN REACTION GASES

Henry W. Gutsche, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jul. 28, 1980, Ser. No. 172,623
Int. Cl.³ C30B *25/10*
U.S. Cl. 156—613 **12 Claims**



1. A continuous process for preparing bodies of crystalline silicon comprising:

a. heating one or more silicon slim rods to decomposition temperature of gaseous silicon compounds;

b. passing the heated silicon slim rods into a chemical vapor deposition chamber;

c. maintaining surface temperature of the silicon slim rods from about 1000° C. to about 1300 C. through heating means;

d. contacting the silicon slim rods with a reaction gas comprised of silicon halide-hydrogen reaction gas containing from about 0.2% to about 5% by weight of silane;

e. depositing silicon on the slim rods as the rods are moved through the decomposition chamber; and

f. withdrawing the resulting enlarged crystalline silicon bodies from the decomposition chamber.

4,464,223

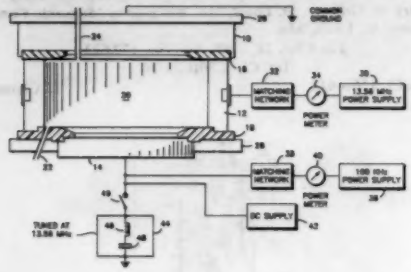
PLASMA REACTOR APPARATUS AND METHOD

Georges J. Gorin, Pinole, Calif., assignor to Tegal Corp., Novato, Calif.

Filed Oct. 3, 1983, Ser. No. 538,593
Int. Cl.³ H01L *21/312*; B44C *1/22*; C03C *15/00*; C23F *1/02*
U.S. Cl. 156—643 **11 Claims**

8. A method for etching a workpiece positioned in a plasma reactor apparatus which comprises the steps of: providing first, second, and third electrodes in said apparatus; injecting a

reactant gas into said apparatus; and creating a reactant gas plasma by selectively applying a high frequency AC field



between said first and second electrodes and a low frequency AC field between said first and third electrodes.

4,464,224

PROCESS FOR MANUFACTURE OF HIGH BULK PAPER

Geza A. Matolcsy, Oakville, Canada, assignor to CIP Inc., Montreal, Canada

Filed Jun. 30, 1982, Ser. No. 393,721
Int. Cl.³ D21H *5/24*
U.S. Cl. 162—111 **15 Claims**

1. A process for the manufacture of a high bulk paper or a high bulk layer of a multi-layered paper, said paper or layer being creped, in which an aqueous slurry consisting essentially of ligno-cellulosic fibers in a papermaking bond forming state is dewatered in contact with a foraminous surface to form a web which is subsequently pressed and dried, characterized in that dry fibers consisting essentially of ligno-cellulosic fibers of the type which when fully wetted have interfiber bonding capacity are introduced into the slurry and interspersed with said bond forming state fibers shortly before formation of the web and in such manner that the web incorporates initially dry fibers which entered the slurry in said introducing step and which remain incompletely wetted by reason of having a short water contact time of less than 45 minutes while the web is formed and pressed and is creped by being passed over a Yankee cylinder, the amount of said incompletely wetted fibers being between 10% and 80% of the total fibers used to form the web.

4,464,225

METHOD AND MACHINE FOR FABRICATING BUILDING BOARDS

Alfred Bubik, Ravensburg, Fed. Rep. of Germany; Oskar Kummer, Kriens, and Burkard Rosenberg, Horw, both of Switzerland, assignors to Bell Maschinenfabrik AG, Kriens, Switzerland

Continuation of Ser. No. 189,103, Sep. 22, 1980, abandoned. This application May 7, 1982, Ser. No. 376,179
Claims priority, application Switzerland, Oct. 8, 1979, 9031/79
Int. Cl.³ D21H *3/66*
U.S. Cl. 162—181.6 **6 Claims**

1. A method of fabricating building plates from a suspension of fibers and a curable material, especially for the fabrication of fiber-reinforced cement plates from an aqueous fiber cement slurry, comprising the steps of:

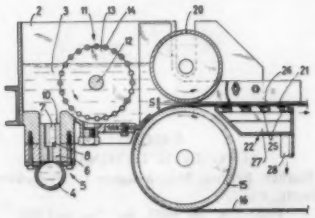
providing a turbulence device containing at least one channel having a substantially step-shaped widened portion terminating in an outlet and through which flows the aqueous fiber cement slurry;

infeeding a suspension composed of fibers and a curable material defining the aqueous fiber cement slurry through the substantially step-shaped widened portion of said turbulence device, in order to place said aqueous fiber cement slurry in a state of intensive and substantially uniform micro-turbulence;

delivering the aqueous fiber cement slurry through the outlet of the step-shaped widened portion and into an intermediate chamber in flow communication with the channel and containing therein an additional turbulence device defining an agitator acting upon the aqueous fiber cement slurry delivered from the outlet of said step-shaped widened portion;

providing a coacting pair of rolls defining therebetween an outlet gas for the intermediate chamber;

subjecting the aqueous fiber cement slurry to the action of the additional turbulence device within the intermediate chamber and prior to delivery of said aqueous fiber cement slurry through said outlet gap;



feeding said aqueous fiber cement slurry from said intermediate chamber through said outlet gap formed between said coacting pair of rolls;

depositing the aqueous fiber cement slurry effluxing out of said outlet gap between said coacting pair of rolls onto a movable band trained about one of said coacting pair of rolls, in order to form upon the movable band a layer of a mixture containing the fibers and the curable material of the aqueous fiber cement slurry; and

dewatering the layer of the mixture containing the fibers and the curable material of the aqueous fiber cement slurry on the movable band so as to form a fiber-reinforced cement plate.

4,464,226

PAPER MACHINE PRESS WITH A WIDE PRESSING ZONE

Mikko Karvinen, Vihtavuori, Finland, assignor to Valmet OY, Finland

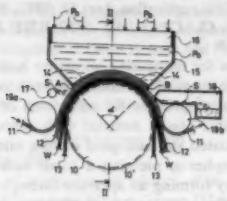
Filed May 13, 1982, Ser. No. 378,019
Claims priority, application Finland, May 20, 1981, 811557
Int. Cl.³ D21F *3/06*
U.S. Cl. 162—358 **9 Claims**

1. In a paper machine dewatering press section for a paper or cardboard web, including a press roll having a wide pressing zone, a belt running in the pressing zone with the web adapted to run in the pressing zone in compression between said roll and said belt, at least one fabric running in the pressing zone acting on a respective face of the web, and pressure transmitting means having a surface overlying said belt substantially in the pressing zone, the improvement comprising:

said pressure transmitting means including a pressure plate having a substantially cylindrical segment configuration, said surface of said pressure transmitting means being constituted by the concave surface of said cylindrical segment plate; and

means provided in association with said pressure transmit-

ting means for applying an ultrasonic field substantially in the pressing zone such that the friction between the con-



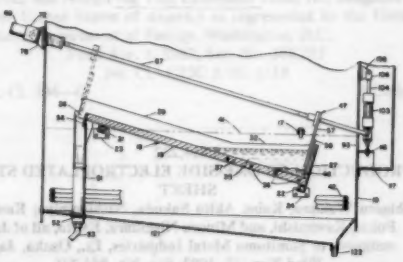
cave surface of said cylindrical segment plate and said belt is substantially reduced.

4,464,227

METHODS AND APPARATUS FOR DISTILLING A CONTAMINATED SOLVENT

Darrel R. Colwell, Oklahoma City, assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Sep. 16, 1982, Ser. No. 418,946
Int. Cl.³ B01D *3/02*
U.S. Cl. 202—170 **4 Claims**



3. An apparatus for distilling a liquid comprising a volatile solvent and contaminants, which comprises:

a chamber;

a trough having an open first end and closed second end;

means for mounting the trough at an incline within the chamber and with the open end elevated with respect to the closed end;

a pusher having a wiper blade fitted within and across the width of the trough;

a chute mounted within said chamber and having a mouth positioned at the open end of said trough for receiving a charge of contaminants;

means for flowing a predetermined charge of liquid into the trough to form a pool of liquid in a distilling section of the trough adjacent to said closed end of the trough;

means for heating said distilling section of the trough to vaporize the solvent to form a vapor which rises to a level beneath the open end of said trough, and falls toward the bottom of the chamber;

means encircling the bottom section of the chamber for cooling and condensing the falling vapors;

means for exiting the condensed solvent from the bottom of the chamber; and

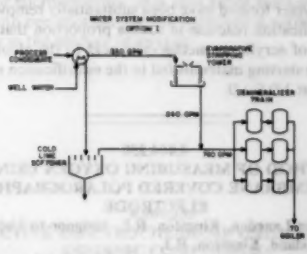
means for reciprocating the pusher to move the wiper blade from an initial position adjacent to the closed end of the trough to the open end of the trough to push residue contaminants into the chute whereafter the pusher and wiper are returned to the initial position.

4,464,228

ENERGY CONSERVATION WITHIN THE KELLOGG AMMONIA PROCESS

L. Fred Roensch, Naperville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 29, 1982, Ser. No. 445,327
Int. Cl.³ B01D *3/34*
U.S. Cl. 203—49 **12 Claims**



1. A method of stripping volatile contaminants from ammonia plant process condensate and recovering a stripped process condensate and using same as a high quality makeup water for operating units within the ammonia process which comprises:

(a) feeding ammonia plant process condensate to the upper stages of an open evaporative stripping tower equipped with a collection basin, and

(b) allowing said condensate to flow downwardly against an upper flow of air, and

(c) operating the evaporative stripping tower in at least a once-through manner, and

(d) collecting the cooled stripped process condensate in the evaporative tower collection basin, and

(e) recovering the stripped process condensate from the evaporative tower basin, and

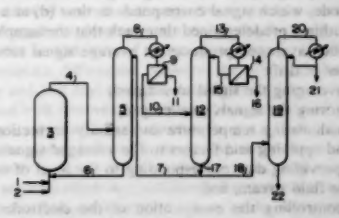
(f) reusing this stripped process condensate as water makeup for other process operating units.

4,464,229

PROCESS FOR PRODUCING ACRYLIC OR METHACRYLIC ESTERS

Takahisa Sato; Sumio Nakashima, and Masao Baba, all of Himeji, Japan, assignors to Nippon Shokubai Kagaku Kogyo Co. Ltd., Osaka, Japan

Filed Jun. 29, 1982, Ser. No. 393,484
Claims priority, application Japan, Jul. 9, 1981, 56-106228; Jul. 29, 1981, 56-117786; Nov. 2, 1981, 56-174557
Int. Cl.³ B01D *3/26, 3/34;* C07C *67/035, 67/54*
U.S. Cl. 203—60 **6 Claims**



1. In a process for producing an acrylic or methacrylic ester by esterifying acrylic or methacrylic acid with a lower ali-

phatic alcohol having 1 to 3 carbon atoms in the presence of an acidic catalyst, the improvement which comprises

(1) distilling the resulting esterification reaction mixture in a distillation column to produce a distillate comprising the acrylic or methacrylic ester, unreacted alcohol, water and any low-boiling impurities while recycling the acrylic or methacrylic ester separated from the unreacted alcohol, water and any low-boiling impurities in the distillate into the distillation column, thereby to yield as said distillate a mixture composed of the acrylic or methacrylic ester, water and the unreacted alcohol and being substantially free from acrylic or methacrylic acid, and (2) recycling the residue from the distillation column, consisting essentially of acrylic or methacrylic acid from which the ester and water formed have been substantially removed, to the esterification reaction in such a proportion that the mole ratio of acrylic or methacrylic acid to the alcohol in the entire starting materials fed to the esterification reaction is kept at 1:0.5–1.0.

4,464,230

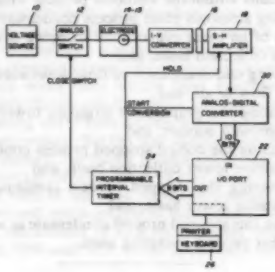
METHOD OF MEASURING OXYGEN USING A MEMBRANE COVERED POLAROGRAPHIC ELECTRODE

Christopher Langdon, Kingston, R.I., assignor to University of Rhode Island, Kingston, R.I.

Filed Apr. 19, 1982, Ser. No. 369,474

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—1 T **7 Claims**



1. A method for detecting the level of oxygen in a fluid stream which includes

(a) placing an electrode in electrolytic communication with a fluid stream containing oxygen;

(b) energizing the electrode for a first duration of time (d);

(c) preventing energization of the electrode for an interval of time (i), which is longer than the duration time (d) the electrode providing a signal corresponding to the level of the oxygen in the fluid stream to be measured;

(d) sampling repeatedly the signal generated from the electrode, which signal corresponds to time (d) at a rate and within a predetermined time such that the sampled signal when averaged produces an average signal substantially free of drift;

(e) averaging the signal so sampled;

(f) storing the signals so averaged;

(g) calculating temperature and salinity correction factors and applying said factors to the averaged signals;

(h) providing data corresponding to the level of oxygen in the fluid stream; and

(i) controlling the energization of the electrode and the sampling, averaging and storing of the signal and the application of the correction factors to the averaged signal in timed sequence.

4,464,231

PROCESS FOR FABRICATING MINIATURE HOLLOW GOLD SPHERES

Paul V. Little, Old Field, N.Y., assignor to Dover Findings Inc., St. James, N.Y.

Continuation-in-part of Ser. No. 199,669, Oct. 22, 1980, abandoned. This application Apr. 19, 1982, Ser. No. 369,408

Int. Cl.³ C25D *1/02, 5/50*; B22D *29/00*

U.S. Cl. 204—9 **3 Claims**

1. A process for fabricating miniature hollow gold spheres comprising the steps of sensitizing spheres of a compressible plastic material to provide for adherance of copper, coating said compressible plastic material with copper, silver plating said copper coated spheres, gold plating said copper coated, silver plated spheres, piercing a small hole in each of the spheres thereby forming an aperture through said gold, silver and copper to the compressible plastic material at the center of each of the copper coated, silver and gold plated spheres, the small cutouts resulting from said piercing being forced into the interior of the spheres, extracting said small cutouts and the compressible plastic material from the center of said spheres by thermal means comprising heating said spheres to expand the compressible plastic material and thereby expelling said small cutouts, and by chemical means comprising evacuating the compressible plastic material from the center of the miniature spheres by dissolving said material by means of chemical solvents, and heat treating said miniature hollow gold spheres to enhance the migration of said gold, copper and silver.

4,464,232

PRODUCTION OF ONE-SIDE ELECTROPLATED STEEL SHEET

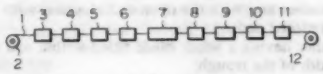
Shigeru Wakano, Kobe; Akito Sakoda, Nishinomiya; Kunihiro Fukui, Kawanishi, and Minoru Nishihara, Kyoto, all of Japan, assignors to Sumitomo Metal Industries, Lt., Osaka, Japan

Filed Nov. 23, 1983, Ser. No. 554,725

Claims priority, application Japan, Nov. 25, 1982, 57-207417; Dec. 21, 1982, 57-225492

Int. Cl.³ C25D *5/48, 7/06*; C25F *5/00*

U.S. Cl. 204—28 **20 Claims**



1. A process for producing one-side electroplated steel sheet with the non-electroplating side having a high affinity for chemical conversion treatment, which comprises preparing a one-side electroplated steel sheet by applying a cathodic current to the electroplating side in an acidic plating bath, simultaneously slightly electroplating the non-electroplating surface thereof with a coating weight of 0.5 to 5 g/m^2 by applying a cathodic current through said non-electroplating surface, and then applying electrolysis to said non-electroplating surface by passing an anodic current through said non-electroplating surface to thoroughly remove the electrodeposits on said non-electroplating surface.

4,464,233

PREPARATION OF ADDUCTS WHICH MAY BE USED IN THE PREPARATION OF COMPOUND SEMICONDUCTOR MATERIALS

John B. Mullin, West Malvern; Arthur K. Holliday, Bromborough; David J. Cole-Hamilton, Ormskirk, and Anthony C. Jones, St. Helens, all of England, assignors to The Secretary of State for Defense in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 22, 1982, Ser. No. 443,733

Claims priority, application United Kingdom, Nov. 25, 1981, 8135592

Int. Cl.³ C25C *1/00*

U.S. Cl. 204—59 QM 9 Claims

1. A method of producing an adduct of an organometallic compound $M^1(R^1)_3$ where M^1 is a Group III metallic element selected from indium and gallium and $(R^1)_3$ represents a plurality of alkyl radicals having from 1 to 7 carbon atoms, which radicals may be the same or different, which method comprises electrolysing, using a sacrificial anode of the metal M^1, a solution containing components A, B, and C as follows:

A: at least one magnesium dialkyl compound $Mg(R^1)_2$;

B: a readily ionisable support electrolyte providing relatively large anions and cations; and

C: a polar aprotic liquid which is a solvent for both components A and B.

4,464,234

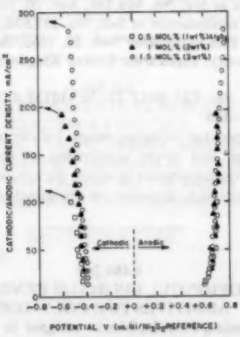
PRODUCTION OF ALUMINUM METAL BY ELECTROLYSIS OF ALUMINUM SULFIDE

Nguyen Q. Minh, Woodridge, Ill.; Raouf O. Loutfy, Tucson, Ariz., and Neng-Ping Yao, Clarendon Hills, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 1, 1982, Ser. No. 364,282

Int. Cl.³ C25C *3/06, 3/18*

U.S. Cl. 204—67 8 Claims



1. A process for producing metallic aluminum and elemental sulfur in an electrolytic cell, comprising forming a molten bath from about 2–10 mol % of aluminum sulfide, one or more alkali metal chlorides, and a chloride component composed of a mixture of an alkaline earth metal chloride present in an amount of about 20–70 mol % and aluminum chloride present in an amount of about 1–10 mol %, conducting electrolysis of the bath at a temperature in the order of 700°–800° C. to produce metallic aluminum and elemental sulfur, the electrolysis being conducted at a cell voltage of about 2.0–3.0 volts and a current density above about 0.2 A/cm², and adding additional aluminum sulfide to the bath during the electrolysis to maintain a concentration of aluminum in the bath at about 2–10 mol %.

4,464,235

CARRYING OUT ELECTROMICROBIAL REDUCTIONS

Helmut Simon, Freising; Johann Bader, Neufahrn, and Helmut Güenther, Haag, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 14, 1983, Ser. No. 513,838

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1982, 3226888

Int. Cl.³ C25B *3/00*

U.S. Cl. 204—73 R 1 Claim

1. A method of carrying out an electromicrobial reduction with the aid of microorganisms which receive the reduction equivalents via an electron carrier which is regenerated electrochemically, wherein the microorganisms employed are aerobic or microaerophilic ones, used either alone or in combination with one another, and the reduction is carried out substantially in the absence of oxygen.

4,464,236

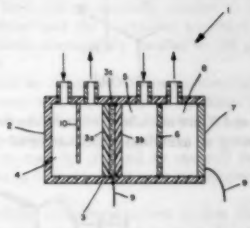
SELECTIVE ELECTROCHEMICAL OXIDATION OF ORGANIC COMPOUNDS

Stephen A. Noding, Brusly, La., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 376,805, May 10, 1982, abandoned. This application May 12, 1983, Ser. No. 493,878

Int. Cl.³ B01K *1/00*; C07C *49/62*; C07B *29/06*

U.S. Cl. 204—78 7 Claims



1. A method for the selective electrolytic oxidation of an aryl-compound to a quinoid compound which comprises the steps of: (a) disposing an aqueous electrolyte solution in a compartment of an electrochemical cell with the electrolyte solution contacting a cathodic and an anodic electrode; the anodic electrode including a first foraminous or porous layer of hydrophobic material, a second foraminous or porous layer with an oxidation catalyst dispersed therein, and a current collector in electrical contact with the second layer, the first layer positioned to contact the aryl-compound and the second layer positioned to contact the aqueous electrolyte solution; (b) transporting the aryl-compound through the first hydrophobic layer to the second layer of the anodic electrode; (c) maintaining a pressure differential between the aqueous electrolyte solution and the aryl-compound sufficiently low to prevent substantial bulk intermixing of the aryl-compound and aqueous electrolyte solution or flow of either the electrolyte solution or the aryl-compound through the anodic electrode whereby a substantially uniform interface between the aryl-compound and the aqueous electrolyte solution is formed at the boundary between the first and second layers or in the second layer of the anodic electrode; (d) supplying an electrical current between the cathodic and anodic electrodes; and (e) removing the quinoid oxidation product from the cell.

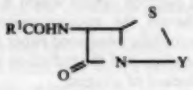
4,464,237

PROCESS FOR PREPARING β-LACTAM DERIVATIVES

Sigeru Torii; Hideo Tanaka; Junzo Nokami; Takashi Shiroi; Michio Sasaoka, all of Okayama, and Norio Saito, Tokushima, all of Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Japan

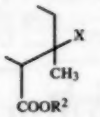
Filed Aug. 9, 1982, Ser. No. 406,519
Int. Cl.³ C25B *3/06*
U.S. Cl. 204—81 **8 Claims**

1. A process for preparing a β-lactam derivative represented by the formula

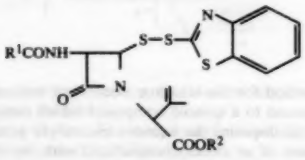


wherein R^1 represents aralkyl group or aryloxy methyl group, Y represents the group

(wherein R^2 represents aryl-substituted lower alkyl group, aryloxy-substituted lower alkyl group or lower alkyl group optionally substituted with halogen atom and X represents halogen atom) or the group



(wherein R^2 and X are as defined above), the process comprising electrolyzing an azetidinone derivative of the formula



wherein R^1 and R^2 are as defined above in the presence of hydrohalogenic acid and/or metal halide, at a current density of about 5 to about 200 mA/cm² and at a temperature of about −30° to about 100° C.

4,464,238

POROUS SEPARATORS FOR ELECTROLYTIC PROCESSES

Donald L. Caldwell, and Kenneth A. Poush, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 9, 1983, Ser. No. 492,977
Int. Cl.³ C25B *1/14, 1/00, 13/00*
U.S. Cl. 204—98 **5 Claims**

1. A method for designing a porous separator for use in an electrolytic process cell, said method comprising,

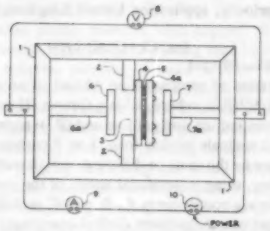
(a) establishing the desired operating parameters for the electrolytic process in which the porous separator is to be installed,

(b) calculating the $N_{mac}t$ value for the separator at the process conditions established in (a) above,

(c) preparing a porous separator characterized by the calculated $N_{mac}t$ value of (b) above, and

(d) installing the so-prepared porous separator in the electrolytic process cell,

said $N_{mac}t$ value representing the product of the MacMullin Number (N_{mac}) times the thickness in inches (t) of the porous separator,



said N_{mac} number being computed from the formula

$$N_{mac}=r/r_o$$

wherein r is the value for the resistance of the electrolyte-saturated separator, and r_o is the value of the resistance of equivalent volume of electrolyte.

4,464,239

ELECTROCATALYST

Alfred C. C. Tseung, 60 Grove Ave., London, England (N10 2AN); Nagendra P. Rasiyah, 19 Wilberforce Rd., Finsbury Park, London, England (N4), and David B. Hibbert, 16 Selkirk Ct., Whitley Rd., London, England (N17)

Continuation of Ser. No. 486,156, Apr. 20, 1983, abandoned, which is a continuation of Ser. No. 231,536, Feb. 4, 1981, abandoned. This application Nov. 10, 1983, Ser. No. 550,716
Claims priority, application United Kingdom, Feb. 11, 1980, 8004483
Int. Cl.³ B01J *23/74;* H01M *4/58*
U.S. Cl. 204—129 **10 Claims**

1. In an apparatus including means for electrochemical oxygen evolution, said means comprising an oxygen evolution electrode, the improvement in which the electrode comprises a lithiated cobalto-cobaltic oxide of the spinel structure.

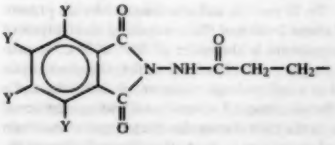
4,464,240

THIODIPROPIONOYL BIS (HALO BENZHYDRAZIDE) ADDITIVES FOR POLYMERS

Ralph H. Hansen, Lincoln, Mass., assignor to Canusa Coating Systems Limited, Ontario, Canada

Filed Nov. 8, 1982, Ser. No. 439,864
Int. Cl.³ C07D *209/52;* C08K *5/34*
U.S. Cl. 204—159.2 **19 Claims**

1. A compound of the formula (I)



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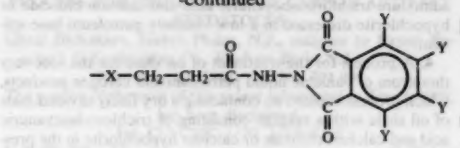


where X is S or S—S and Y is H, Cl or Br with at least one Y always being Cl or Br.

4,464,241

ELECTROPHORETIC COATING PROCESS

Andrew Doroszkowski, Slough, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Nov. 12, 1981, Ser. No. 320,570

Claims priority, application United Kingdom, Nov. 19, 1980, 8037109

Int. Cl.³ C25D *13/06, 13/10*

U.S. Cl. 204—181 C **7 Claims**

1. A process of coating an electrically conductive cathodic substrate with a film-forming material wherein the substrate is immersed as a cathode in a stable aqueous dispersion of

(i) a derivative of the film-forming material which comprises a hydrophilic cationic group primarily responsible for the stability of the dispersion and hydrolysable at the cathode the film-forming material being destabilised and caused to deposit at the cathode under the conditions prevailing at the cathode when an electrical current is passed,

or of (ii) the film-forming material stabilised by association with a distinct surfactant, which surfactant comprises a hydrophilic cationic group primarily responsible for the stability of the dispersion and hydrolysable at the cathode the film-forming material being destabilised and caused to deposit at the cathode under the conditions prevailing at the cathode when an electrical current is passed,

and an electric current is passed through an electrical circuit between the substrate cathode and a counterelectrode in the dispersion for a sufficient period of time to yield a coating of the film-forming material on the substrate.

4,464,242

ELECTRODE STRUCTURE FOR USE IN ELECTROLYTIC CELL

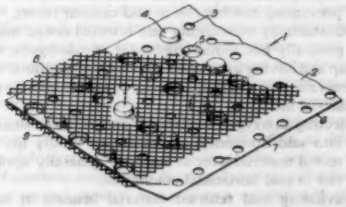
Thomas W. Boulton, Cheshire, England, assignor to Imperial Chemical Industries PLC, Hertfordshire, England

Filed Nov. 12, 1982, Ser. No. 440,855

Claims priority, application United Kingdom, Nov. 24, 1981, 8135410

Int. Cl.³ C25B *11/03*

U.S. Cl. 204—253 **13 Claims**



13. An electrode structure as claimed in any one of claims **1** **3** or **6** characterised in that the projections on one surface of the sheet material are staggered in position with respect to those on the opposite surface of the sheet material.

4,464,243

ELECTRODE FOR USE IN ELECTROLYTIC CELL

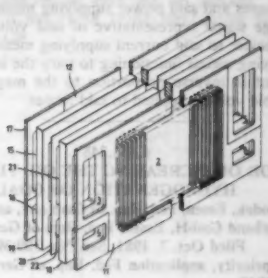
Robin A. Woolhouse, Bunsbury, Nr Tarporley, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jul. 20, 1981, Ser. No. 284,946

Claims priority, application United Kingdom, Jul. 30, 1980, 8024922; Sep. 18, 1980, 8030230

Int. Cl.³ C25B *9/00, 11/02, 11/10*

U.S. Cl. 204—257 **20 Claims**



1. An electrode, suitable for use in an electrolytic cell of the filter press type, characterized in that the electrode comprises a substantially planar support member and, on both faces of the support member, a plurality of substantially vertically disposed elongated members substantially parallel to each other and each attached at the ends thereof to the support member, a substantial part of each of the elongated members lying in a plane displaced from and substantially parallel to the plane of the support number and the elongated members presenting faces lying in planes substantially parallel to the plane of the support member.

15. An electrode as claimed in claim **1** characterised in that the electrode comprises a plurality of openings in the face thereof which when the electrode is assembled in an electrolytic cell, define compartments lengthwise of the cell through which electrolyte may be charged to the cell and through which the products of electrolysis may be removed from the cell.

18. An electrolytic cell characterised in that the cell comprises a plurality of electrodes as claimed in claim **1**.

4,464,244

OXYGEN SENSING DEVICE HAVING SOLID ELECTROLYTE CELL AND MEANS FOR SUPPLYING CONTROLLED CURRENT THERETO

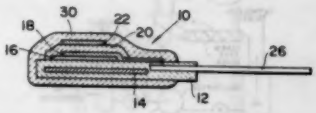
Masaaki Uchida, and Shigeo Isitani, both of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 8, 1982, Ser. No. 386,427

Claims priority, application Japan, Jun. 23, 1981, 56-97235

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—425 **5 Claims**



1. A device for detecting the concentration of oxygen in gases, comprising: p1 an oxygen sensor element comprising:

a ceramic substrate having a heater in operative combination therewith; and

a laminate layer comprising a reference electrode layer, an

oxygen ion conductive solid electrolyte layer and a measurement electrode layer;

a power supplying means for applying a variable voltage to said heater in said substrate to maintain the heater at a predetermined temperature by controlling the resistance of said heater at a constant value;

a current supplying means for supplying a controlled DC current to said laminate to maintain a reference partial pressure at the interface between said reference electrode layer and said solid electrolyte layer; and

a link means for electrically associating said current supplying means and said power supplying means to transmit a voltage signal representative of said voltage applied to said heater to said current supplying means, said current supplying means functioning to vary the intensity of said current in inverse proportion to the magnitude of said variable voltage applied to said heater.

4,464,245

METHOD OF INCREASING THE OIL YIELD FROM HYDROGENATION OF COAL

Werner Hodek, Essen, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Oct. 7, 1981, Ser. No. 309,396

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1980, 3038842

Int. Cl.³ C10G *1/06*

U.S. Cl. 208—10 **6 Claims**

1. A method of increasing the overall oil yield from hydrogenation of coal by releasing additional oil amounts from a separated asphalts-containing hydrogenation residue obtained in a hot separation operation following initial coal hydrogenation and consisting of components boiling at temperatures above 300° C., if at all, comprising the steps of adding to the residue only a light oil fraction obtained during the initial coal hydrogenation and having a boiling range of between 35° and 200° C. for the light oil fraction to act as a solvent for the residue; and hydrogenating the solution at a temperature in the range between 350° and 450° C. under a hydrogen pressure of 300 to 400 bar for 0.5 to 2 hours.

4,464,246

REAGENT AND PROCESS FOR RECOVERING OIL AND KEROGENS FROM OIL SHALE

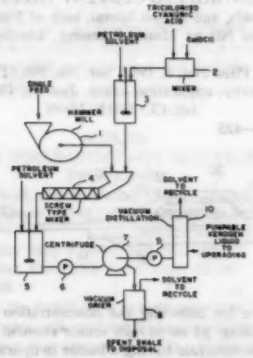
Joseph Sanda, Surrey, Canada, assignor to Kohle Energy Research Consultants Inc., Canada

Filed Nov. 9, 1981, Ser. No. 319,418

Claims priority, application Australia, Dec. 30, 1980, PE07076

Int. Cl.³ C10G *1/04;* C09K *7/06;* E21B *43/22*

U.S. Cl. 208—11 LE **4 Claims**



1. A conditioning agent for use in the recovery of crude oil and substrate bound kerogen materials consisting of in intimate admixture trichloro-isocyanuric acid and calcium chloride or hypochlorite dispersed in a low viscosity petroleum base solvent.

4. A process for the treatment of oil shale for the recovery therefrom of valuable liquid petroleum and kerogen products, which process consists in: contacting a dry finely divided mass of oil shale with a reagent consisting of trichloro-isocyanuric acid and calcium chloride or calcium hypochlorite in the presence of a low viscosity petroleum solvent, whereby to free the high viscosity crude petroleum and/or kerogens from substrate solids and produce an oily liquid phase of relatively low viscosity containing dissolved and dispersed kerogens; and collecting said oily liquid phase.

4,464,247

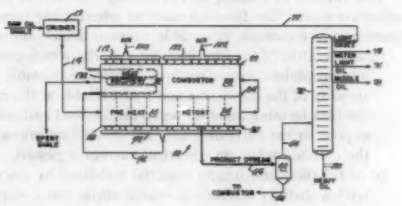
HORIZONTAL FLUID BED RETORTING PROCESS

Milton B. Thacker, Salt Lake City, Utah, assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 13, 1983, Ser. No. 541,525

Int. Cl.³ C10G *1/02;* C10B *53/06*

U.S. Cl. 208—11 R **20 Claims**



1. A process for retorting solid hydrocarbon-containing material, comprising the steps of:

(a) indirectly heating raw solid hydrocarbon-containing material in a cellular retort to a retorting temperature, said cellular retort having a series of barriers extending generally upwardly from a floor and a series of generally upright baffles spaced above said floor, said baffles positioned alternately between said barriers;

(b) fluidly moving said raw solid hydrocarbon-containing material generally horizontally through said cellular retort over said barriers and under said baffles in a generally S-shaped flow pattern for a sufficient period of time at said retorting temperature to liberate light hydrocarbon gases and oil from said raw solid hydrocarbon-containing material leaving retorted coked hydrocarbon-containing material by

injecting a fluidizing lift gas into said cellular retort to fluidly lift said raw hydrocarbon-containing material over said barriers, and

gravitating said raw hydrocarbon-containing material beneath said baffles, while simultaneously substantially preventing combustion in said cellular retort;

(c) substantially combusting said retorted coked material in a generally horizontal combustor in side-byside relationship and having a common wall with said cellular retort to generate said indirect heat for step (a) and form spent material including

injecting an oxygen-containing, combustion-sustaining gas into said horizontal combustor to fluidly lift said retorted material over at least one generally upright barrier in said horizontal combustor,

gravitating said retorted material beneath at least one generally upright baffle in said horizontal combustor, and

fluidly moving said retorted material generally horizontally through said horizontal combustor in a flow direction generally opposite the flow direction of said raw hydrocarbon-containing material in said cellular retort.

4,464,248

PROCESS FOR PRODUCTION OF CARBON ARTIFACT FEEDSTOCKS

Ghazi Dickakian, Scotch Plains, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 11, 1981, Ser. No. 291,986

The portion of the term of this patent subsequent to Jun. 2, 1998, has been disclaimed.

Int. Cl.³ C10C 1/20, 1/18, 3/08

U.S. Cl. 208—44 3 Claims

1. A process for preparing a feedstock suitable for carbon fiber production comprising:

(1) treating a cat cracker bottom which boils in the range from about 100° C. to about 550° C. to remove from about 10% to about 90% by weight of the fractions present in said cat cracker bottom which boil below about 400° C.;

(2) adding a dealkylation catalyst in amounts ranging from about 0.1 weight percent to about 1.0 weight percent to said treated cat cracker bottom of step 1, said dealkylation catalyst being selected from the group consisting of Lewis acid, Lewis acid salts and heavy metal halides;

(3) heating said mixture from step 2 above at temperatures ranging from about 350° C. to about 410° C. for times ranging from about ¼ to about 5 hours;

(4) vacuum stripping the resultant mixture from step 3 at temperatures in the range from about 300° C. to about 370° C., at pressures ranging from about 1.0 to about 3 mm of Hg to remove at least a portion of the aromatic oils present in said catalytic heat soaked pitch;

(5) adding an organic fluxing liquid to said vacuum stripped pitch to provide a fluid pitch containing insoluble solids suspended therein, said organic fluxing liquid being employed in the range from about 0.5 to about 3 parts by weight of liquid per part of pitch;

(6) filtering said pitch from step 5 to separate said solids;

(7) treating said separated fluid pitch from step 6 with an antisolvent selected from the group consisting of aromatic and alkyl substituted aromatic hydrocarbons, cyclic ethers and mixtures thereof in an amount sufficient to provide a solvent insoluble fraction which is capable of being thermally converted into a deformable pitch containing greater than 75% of an optically anisotropic phase; and

(8) separating said solvent insoluble fraction whereby a pitch suitable for carbon fiber production is obtained.

4,464,249

PLURAL STAGE REFORMING WITH CATALYSTS HAVING A SKEWED DISTRIBUTION OF A PLATINUM-GROUP METAL AND RHENIUM

John Mooi, and Marvin F. L. Johnson, both of Homewood, Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Oct. 15, 1979, Ser. No. 84,948

Int. Cl.³ C10G 35/06

U.S. Cl. 208—65 13 Claims

1. In a method for reforming a naphthene and paraffin-containing hydrocarbon feed boiling in the gasoline or naphtha range in the presence of molecular hydrogen wherein a series of zones are employed to provide reformates of at least about 90 RON and wherein there are hydrogen-containing recycled gas and at least one reactivation, the improvement which comprises providing at least one naphthene dehydrogenation zone in an early portion of said series of reaction zones, said naphthene dehydrogenation zone having a first catalyst comprising a catalytically effective amount of a supported platinum-group metal and rhenium and providing at least one paraffin dehydrocyclization zone in a later portion of said series of reaction zones, said paraffin dehydrocyclization zone having a second catalyst comprising a catalytically effective amount of a supported platinum-group metal and rhenium wherein the ratio of the percent by weight of the supported platinum-group metal in the first catalyst to that in the second catalyst is in the range of about 1.5 to about 10, introducing a hydrocarbon boiling in the gasoline or naphtha range into such naphthene dehydrogenation zone at an inlet temperature of at least about 820° F., passing effluent from said naphthene dehydrogenation zone serially through the reaction zone wherein the inlet temperature of a paraffin dehydrocyclization zone is in the range of about 900° to 1000° F. and controlled to provide a reformate at least about 90 RON.

4,464,250

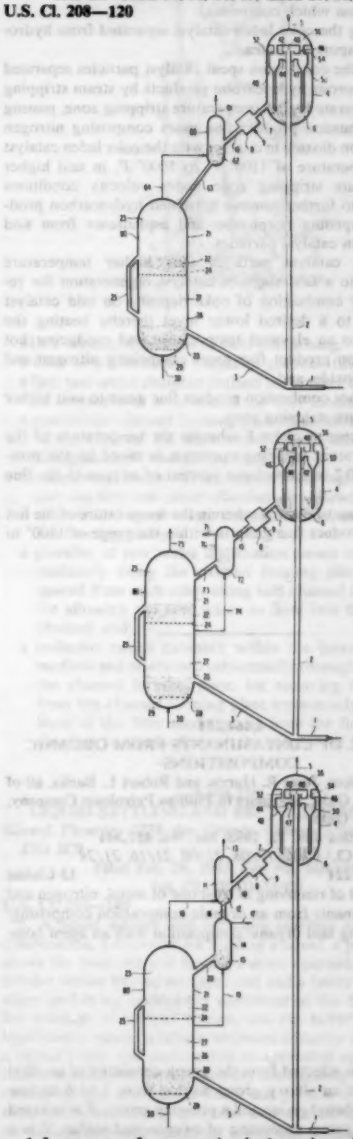
STRIPPING HYDROCARBONS FROM CATALYST WITH COMBUSTION GASES

Virginia K. Myers; Bill E. McKay, Jr., and Lloyd E. Busch, all of Ashland, Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Jul. 30, 1981, Ser. No. 288,433

Int. Cl.³ C10G 11/18, 11/05; B01J 29/38, 21/20

U.S. Cl. 208—120 6 Claims



1. In a process for converting hydrocarbon oil feeds boiling above about 650° F. comprising Conradson carbon producing

component and metal contaminants known as carbo-metallic components boiling above about 1025° F. by contact with a crystalline zeolite containing catalyst particles provided at a sufficiently elevated temperature to effect a desired catalytic conversion of the hydrocarbon feed to lower boiling liquid products including gasoline whereby the catalyst particles become spent by an accumulation of coke deposits and the spent catalyst is regenerated by combustion of the accumulated coke deposits with a combustion supporting gas in a sequence of two separate catalyst regeneration zones, the improved method for stripping the coke laden catalyst particles substantially separated from vaporous hydrocarbon products of catalytic conversion which comprises,

A. stripping the coke laden catalyst separated from hydrocarbon vapors with steam,

B. passing the coke laden spent catalyst particles separated from vaporous hydrocarbon products by steam stripping into a separate higher temperature stripping zone, passing hot combustion product flue gases comprising nitrogen and carbon dioxide in contact with the coke laden catalyst at a temperature of 1100° F. to 1600° F. in said higher temperature stripping zone under velocity conditions selected to further remove entrained hydrocarbon products comprising porphyrins and asphaltenes from said coke laden catalyst particles,

C. passing catalyst particles thus higher temperature stripped to a first stage of catalyst regeneration for removal by combustion of coke deposits on said catalyst particles to a desired lower level thereby heating the catalyst to an elevated temperature and producing hot combustion product flue gases comprising nitrogen and carbon dioxide, and

D. passing hot combustion product flue gases to said higher temperature stripping zone.

2. The process of claim 1 wherein the temperature of the higher temperature stripping operation is raised by the presence of from 0.2 to 2.0 volume percent of oxygen in the flue gases.

3. The process of claim 1 wherein the temperature of the hot combustion product flue gases is within the range of 1100° to 1500° F.

4,464,251
REMOVAL OF CONTAMINANTS FROM ORGANIC COMPOSITIONS

Semyon G. Kukes; Jesse R. Harris, and Robert L. Banks, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 12, 1983, Ser. No. 457,341
Int. Cl.³ C10G *17/08, 21/08, 21/16, 21/24*
U.S. Cl. 208—221 **13 Claims**

1. A method of removing at least one of metal, nitrogen and sulfur contaminants from an organic composition comprising:

(a) contacting said organic composition with an agent comprising

$$R_nP(X)Y_{x-n}$$

where R is selected from the group consisting of an alkyl group and an alkoxy group having from 1 to 6 carbon atoms, a phenyl group and a phenoxy group; X is selected from the group consisting of oxygen and sulfur; Y is a halogen; n is 0 through 2 and x is 3

under conditions sufficient to form a precipitate, including said contaminants;

(b) contacting said organic composition, containing said precipate, with an acid gas in the presence of water under conditions sufficient to form a distinct phase, including said contaminants, which is separable from said organic composition; and

(c) separating said distinct phase from said organic composition.

4,464,252
ADSORBENTS FOR SULFUR REMOVAL

Paul E. Eberly, Jr., and William E. Winter, Jr., both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 23, 1982, Ser. No. 410,250
Int. Cl.³ C10G *29/04*
U.S. Cl. 208—243 **6 Claims**

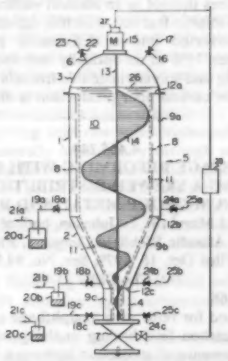
1. A process for the removal of sulfur from a sulfur-containing hydrocarbon feed which comprises

contacting said sulfur-containing hydrocarbon feed with a bed of spent regenerated hydrofining catalyst consisting essentially of vanadium and a Group VIII metal, or a Group VI-B metal, or both Group VI-B/Group VIII metals deposited on a support, said support comprising alumina.

4,464,253
CONTINUOUS FILTER

Setuya Kuri, Kamakura, Japan, assignor to Kuri Chemical Engineers Incorporated, Tokyo, Japan

Filed Mar. 7, 1983, Ser. No. 472,845
Claims priority, application Japan, Mar. 8, 1982, 57-35131
Int. Cl.³ B01D *21/06*
U.S. Cl. 210—112 **4 Claims**



1. A continuous filter comprising a chamber provided with a cylindrical upper portion and a conical lower portion and having at its upper end portion a feed opening for a slurry to be filtered and at its lower end portion a discharge opening for the filtration cake, an electromagnetic valve for opening and closing said discharge opening, a porous support disposed inwardly of, and spaced from, the side wall of the chamber, a filter medium provided on the porous support, an outer annular filtrate-collecting space and an inner, slurry-and cake-holding space defined by the porous support, an agitation shaft extending from the slurry feeding end portion to the cake discharge end portion through said slurry-and cake-holding space, a motor for rotating said shaft, a spiral or vane-like blade on the agitating shaft for shaving the cake on the filter medium and moving it to the discharge end portion of the chamber, means for detecting the torque on said motor as a function of

the squeeze ratio of said filtration cake at said lower end portion, and means for automatically opening and closing said electromagnetic valve in response to the torque detected by said torque detecting means, whereby when the squeeze ratio is below a preset value, the electromagnetic valve automatically closes the discharge opening and when the squeeze ratio is above said preset value, the electromagnetic valve automatically opens the discharge opening so that the filtration cake can be discharged from said chamber through said discharge opening.

4,464,254

DEVICE FOR SEPARATING SERUM FROM BLOOD SAMPLE

Kassim H. V. M. Dojki, Riverdale, and Isokim Haldopoulois, Peachtree City, both of Ga., assignors to Porex Technologies, Corp., Fairburn, Ga.

Filed Jun. 3, 1982, Ser. No. 384,562
Int. Cl.³ B01D *21/26, 33/00*
U.S. Cl. 210—136 **9 Claims**

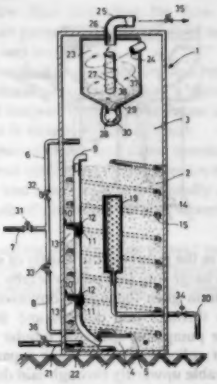
1. A filter separator comprising a test tube having walls, a sampling tube designed to fit within said test tube and having a piston head mounted in one end of said sampling tube constructed to engage and form a seal with the walls of said test tube when said sampling tube is being inserted into said test tube, said piston head being made of elastomeric material and defining a passageway through said piston head into the interior of said test tube, said passageway defining a ball chamber containing a ball, the lower side of the ball chamber defining a seat for said ball, said seat being defined by the elastomeric material of said piston head and being constructed to comprise means to form a sealing engagement with said ball in response to said ball being forced into engagement with said seat by a reduced pressure within said test tube beneath said piston head and to grip said ball in sealing engagement by the resilience of the elastomeric material of said seat causing said seat to press around said ball after said reduced pressure terminates and apart from any force applied to said ball pushing said ball into engagement with said seat.

4,464,255

WATER PURIFICATION DEVICE

Yoshihiko Ueda, Yamaguchi, Japan, assignor to Takara Kogyo Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1983, Ser. No. 471,162
Claims priority, application Japan, Jul. 27, 1982, 57-129661
Int. Cl.³ B01D *23/10*
U.S. Cl. 210—136 **15 Claims**



11. A water purification device, comprising:
a filter tank containing a layer of granular filter medium;
a first raw water chamber defined in the filter tank and being in contact with a surface of the filter medium;
a continuous channel forming plate mounted at a periphery of the layer of the filter medium and extending spirally along an inner wall of the filter tank;
an upper end means of the channel forming plate, opened into the first raw water chamber, for allowing raw water to flow into a raw water channel defined under the channel forming plate;
a plurality of raw water distribution means mounted intermediately along the channel forming plate and axially spaced from each other along said channel forming plate, for allowing the raw water to flow into the raw water channel; and
a collector means mounted within the layer of the filter medium and positioned substantially through the center of the channel forming plate, for receiving filtered water from the channel forming plate transversely through the layer of the filter medium and from the first raw water chamber vertically through the layer of the filter medium.

4,464,256

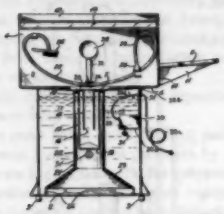
LIQUID SETTLING AND RECYCLING MACHINE

Gérard Plourde, 2755 des Grands Coteaux, Beloeil, Canada J3G 2C9

Filed Feb. 24, 1983, Ser. No. 469,154
Int. Cl.³ B01D *21/00*
U.S. Cl. 210—149 **6 Claims**

1. A liquid settling and recycling machine comprising, in combination, a reservoir for holding a liquid, a pan positioned above the reservoir and having a drain aperture, an upstream tubular device having an upper end and a lower end with the upper end being operatively associated to the drain aperture for drainage of the pan therein, and the lower end forming liquid outlet means, a tubular sediment collector device having a closed lower end portion and an apertured upper end portion, said collector device spacedly surrounding said upstream tubular device, said closed lower end portion forming a sediment holder underlying the outlet means of the upstream tubular device, and said apertured upper end portion forming an outward discharge for said liquid, a downstream tubular de-

vice spacedly surrounding said collector device and having an upper end and a lower end, said upper end of the downstream tubular device operatively communicating with the apertured upper end portion for discharge from the latter therein and said lower end of the downstream tubular device opening into said reservoir adjacent the bottom thereof for discharge of the liquid therethrough, and a liquid circulation pump having an



inlet submerged in the reservoir outwardly of said devices, and an outlet for discharge into said pan, whereby the liquid drainage from said drain goes through a downward and upward wandering flow through said devices and the reservoir for recycling by the pump the upstream tubular device and the tubular sediment collector device being separable from each other and removable upwardly through said drain aperture for emptying of the sediment holder.

4,464,257

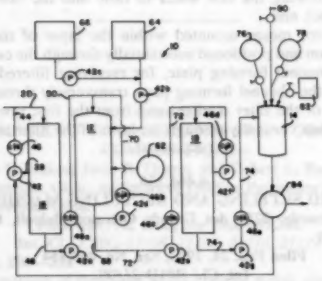
APPARATUS FOR THE TREATMENT OF WASTEWATER SLUDGE

Joseph M. Lynch, Secaucus; James R. Pfafflin, Gillette, both of N.J.; Calman Pecker, Long Island City; Raul Cardenas, Tappan, both of N.Y.; Seamus Cunningham, Secaucus, N.J.; Richard T. Bozzone, Sr., Parsippany, N.J., and Sidney Borg, Hoboken, N.J., assignors to Process Research Development & Management, Inc., Hoboken, N.J.

Filed Sep. 30, 1982, Ser. No. 429,859

Int. Cl.³ C02F *11/14*

U.S. Cl. 210—195.1 **8 Claims**



1. Apparatus for the treatment of wastewater sludge, comprising:

a plurality of reaction vessels;

means for admitting sludge into one of said vessels; and

means for discharging sludge from said one vessel; wherein

said admitting and discharging means comprise means cooperative for maintaining a given level of sludge in said one vessel; and further including

means coupled to said one vessel for pressurizing the latter to a pressure taken from a range of from approximately thirty to approximately sixty pounds per square inch;

means coupled to said one vessel for introducing a pH depressant thereinto; and

means coupled to said one vessel for introducing an oxidizing agent thereinto; wherein

said pressurizing means comprises means for coincidentally aerating sludge in said one vessel while pressurizing said one vessel;

said aerating means comprises a vertical multiple-apertured cylinder capped at opposite ends supported within said one vessel below the aforesaid given level therewithin, which is maintained by said admitting and discharging means as aforesaid, for effecting aeration of sludge from within said one vessel;

means for maintaining sludge within said one vessel in a state of turbulence;

said turbulence-maintaining means comprising means for communicating said admitting and discharging means, to effect recirculation of sludge from said discharging means to said admitting means, and to maintain a turbulence in said sludge as aforesaid, said admitting means including means supported in said one vessel above said level for dispersing sludge admitted to said one vessel;

means for communicating said discharging means with another of said reaction vessels;

sludge dewatering means interposed between said one and said another reaction vessels;

means coupled to said another reaction vessel for admitting ozone and air thereinto; and

means for removing treated sludge from said another reaction vessel.

4,464,258

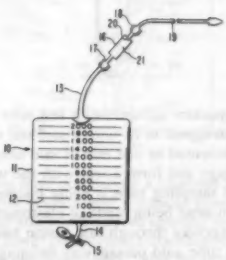
CONTAINER HOUSING BIOCIDAL DISPENSING DEVICE

Patrick S. Wong, Kowloon, Hong Kong; Jimmy B. Langston, San Jose, and Harold M. Leeper, Mountain View, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 137,538, Apr. 4, 1980, abandoned, and a continuation-in-part of Ser. No. 78,507, Sep. 24, 1979, Pat. No. 4,241,733, which is a division of Ser. No. 804,962, Jun. 9, 1977, Pat. No. 4,193,403. This application Jan. 3, 1983, Ser. No. 455,391

Int. Cl.³ C02B *3/06*

U.S. Cl. 210—205 **5 Claims**



1. A collection system for controlling pathogens in fluids, comprising in combination: a container for receiving and storing a fluid; an inlet port in the container for admitting a fluid into the container; a dispensing device in the container for substantially controlling the presence of pathogens in fluid admitted into the container; the dispensing device comprising a body shaped and sized for placement in the container, which body is formed of a polymeric material containing therein a biocidally effective amount of a methenamine of the general formula:

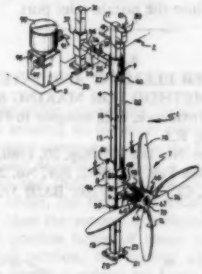
said body having at least one polymeric surface exposed to the container for dispensing the methenamine from the device in a biocidally effective amount into fluid in the container that contacts the surface of the device for substantially controlling the presence of pathogens in fluid received into container.

4,464,259

HYDRAULIC HORIZONTAL MIXER

Roy A. Cramer, and Barry G. Cramer, both of Kansas City, Mo., assignors to Air-O-Lator Corporation, Kansas City, Mo.

Filed Sep. 30, 1982, Ser. No. 430,719
Int. Cl.³ C02F *3/02*
U.S. Cl. 210—219 **6 Claims**



3. A liquid circulating apparatus for circulating fluid in a sewage treatment facility, thereby increasing the rate and efficiency of biodegradation of sewage being treated therein, and comprising:

(a) an upright beam member for extending into a body of liquid and having upper and lower ends;

(b) support means for said beam member providing for holding same in an upright attitude including:

(1) a lower ball pivot at said lower end of said beam member wherein said lower end has a concave wall and rotatably engages a ball pivot extending from a bottom surface of said body of liquid;

(2) an upper support arm having a clamp means thereon; said clamp means providing for support of said beam member substantially near said upper end thereof; said clamp means adapted for permitting rotation of said beam member therein and restraint of said beam member in a selected position following adjustment by rotation;

(c) an acutation arm connected to said beam member providing a handle for rotation of said beam member about a longitudinal axis;

(d) a U-shaped bracket mounted on said beam member and including spaced sidewalls and an end wall;

(e) a submersible, hydraulically driven motor, mounted on said bracket and extending outwardly of said endwall;

(1) said hydraulically driven motor having flexible inlet and outlet lines connected thereto for providing flow of hydraulic fluid under pressure therethrough and providing for operation of said motor regardless of rotation and tilting of said beam member;

(f) a hydraulic pump system communicating with said hydraulically driven motor including:

(1) a pump providing for pressurized flow of hydraulic fluid;

(2) a reservoir providing a source of said hydraulic fluid;

(3) speed control means providing for control of fluid flow through said motor and thereby controlling the speed of said motor;

(4) fluid flow lines providing for flow communication among said pump, said speed control means, said reservoir and said motor;

(g) a propeller operably connected to and rotatably powered by said hydraulic motor to effect a directed circulating flow in said body of liquid and to create a vortex therein; whereby air is mixed with said liquid;

(h) a winch mounted on said beam member adjacent said upper end and connected to said bracket in order to selectively raise and lower said hydraulically driven motor to control depth of placement of said motor in said body of liquid; and

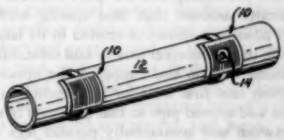
(i) means mounting said bracket to said beam member including front and rear guides extending between said bracket sidewalls and capturing said beam member therebetween.

4,464,260

BRACELET MOUNTED SCREEN FILTER

Michel Duneau, Beaumont La Tricherie, France, assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 4, 1983, Ser. No. 520,266
Int. Cl.³ B01D *23/20*
U.S. Cl. 210—232 **7 Claims**



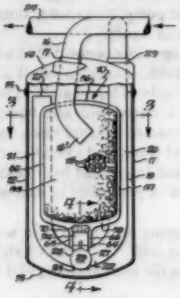
1. A separation device adapted to be mounted to the exterior surface of a cylindrical fluid distributing and/or collection conduit located in a bed of solid particulate media for preventing entry of the solid media into an aperture in said conduit which is covered thereby, said device including a molded plastic frame portion adapted to be held in sealed relationship to said conduit in a region immediately surrounding said aperture; a molded plastic slotted screen surface portion integral with and supported by said frame portion at a spaced radial distance from said conduit and aperture; said screen surface portion including a plurality of uniformly spaced profile wire-like portions which have a generally planar outer surface and inwardly converging side portions which define a plurality of inwardly diverging slot openings, the width of said slot openings being less than about the smallest dimension of the solid particulate media but the total area of said slot openings being substantially greater than the area of said one aperture; and a pair of integral retaining members extending from opposed sides of said frame portion, said pair of retaining members being adapted to extend around at least the major portion of the circumferential extent of the conduit and to transmit a tension force to said frame portion to hold it in tight sealed engagement with said conduit.

4,464,261

ADSORBENT DEVICE

John S. Cullen, Buffalo; Samuel A. Incorvia, and James A. Vogt, both of Tonawanda, all of N.Y., assignors to Multiform Desiccants, Inc., Buffalo, N.Y.

Filed Jul. 28, 1982, Ser. No. 402,757
Int. Cl.³ B01D *15/00*
U.S. Cl. 210—282 **12 Claims**



1. In a refrigerant receiver having a receiver axis and an U-shaped pipe therein with two substantially parallel legs each having a leg axis substantially parallel to said receiver axis and connected by a lower pipe portion, and also having a second pipe spaced from a first plane containing said leg axes and having a portion lying between a pair of second planes substantially perpendicular to said first plane and with each of said second planes containing one of said leg axes, an adsorbent device comprising a casing, adsorbent in said casing, a first wall on said casing, first spaced wall portions on said first wall for placement in contiguous relationship to said parallel legs, and a second wall portion located between said first spaced wall portions and positioned between said two substantially parallel legs and protruding into the space between said parallel legs a greater amount than said spaced wall portions, whereby said adsorbent device is limited in its lateral movement transverse to said receiver axis by said substantially parallel legs, a second wall on said casing on the opposite side of said casing from said first wall for placement in contiguous relationship to said second pipe so that a portion of said casing is located between said substantially parallel legs of said U-shaped pipe and said second pipe, whereby said adsorbent device is limited in its lateral movement transverse to said receiver axis by said substantially parallel legs and said second pipe, tab means on said casing for placement proximate said lower pipe portion, and securement means for securing said tab means to said lower pipe portion, whereby said adsorbent device is limited in its movement relative to said lower pipe portion in the direction of said receiver axis.

4,464,262

LIQUID FLOW DISTRIBUTOR

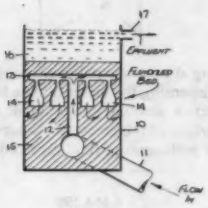
Roger W. Owens, Deer Park, N.Y.; Robert F. Hickey, Florence, Mass., and Constantine Capetanopoulos, Dobbs Ferry, N.Y., assignors to Ecolotrol, Inc., Bethpage, N.Y.

Filed Jul. 1, 1982, Ser. No. 394,147
Int. Cl.³ B01D *35/22*; B05B *15/04*
U.S. Cl. 210—291 **8 Claims**

1. A flow distributor for dispersing wastewater or other incoming liquids carrying stringy solids throughout a particulate media in a fluidized bed such as in a fluidized bed reactor, the distributor permitting forward flow of the liquid without clogging and also functioning to prevent backflow of the media into the distributor should forward flow be arrested, said distributor comprising:

A a manifold for conducting the incoming liquid into an array of openings;

B a nozzle communicating with each opening and disposed in said fluidized bed to discharge said incoming fluid therein, said nozzle having an inlet port leading to a conical flow expansion section whose cone angle which lies in



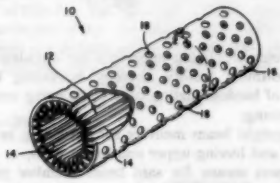
a range of about 15 to 60 degrees is such that the production of backward eddy current or significant turbulence will be minimized, said expansion section merging with an open-ended cylindrical outlet section whose dimensions are such that any backflow which takes place when forward flow is arrested will normally be insufficient to lift the particles into the nozzle inlet port.

4,464,263

PLEATED FILTER ELEMENT AND INTEGRAL SHIELD AND METHOD FOR MAKING SAME

Peter Brownell, Providence, R.I., assignor to Fram Corporation, East Providence, R.I.

Continuation of Ser. No. 182,909, Sep. 20, 1980, abandoned. This application Feb. 18, 1982, Ser. No. 349,899
Int. Cl.³ B01D *27/08*; B32B *5/20*
U.S. Cl. 210—484 **6 Claims**



1. An integral filter element comprising:

a sheet of filtering media, said filtering media sheet having a multiplicity of substantially parallel elongated folds therein, said folds being successively disposed in opposite directions to provide a plurality of elongated V-shaped pleats in said filtering media sheet, said pleats defining like-disposed folds, said sheet being joined at its ends and rolled to define an annular filter having inner and outer diameters with its pleats parallel to the axis of the annulus so that the pleats define inner and outer apexes at respectively the inner and outer diameters of said annular filter; and

a fluid-permeable, shape-retaining, structurally self-supporting shield circumscribing the outside of said annular filter and integrally bonded to the like-disposed folds of said filtering media sheet, said shield being formed of a shape-retaining, structurally self-supporting, fluid permeable cellular plastic and laterally extending from one like-disposed fold to the next adjacent like-disposed fold so as to space apart said folds, said shield further extending longitudinally along said like-disposed folds and providing a substantially continuous bond between said shield and said

like-disposed folds to restrain like-disposed folds from movement relative to said shield, said bond being formed by partially embedding the outer apex of each V-shaped pleat into said shield during the transition of the shield from a foamed liquid to said shape-retaining solid, the portion of each pleat between the inner and outer apexes thereof being unsupported by said shield.

4,464,264

CYCLONE SEPARATOR

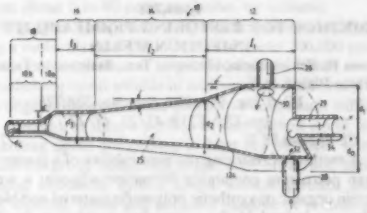
Noel Carroll, Sherbrooke Rd., Sherbrooke, Victoria, Australia

Filed Dec. 13, 1982, Ser. No. 449,395

Claims priority, application Australia, Mar. 4, 1982, PF2973; Mar. 11, 1982, PF3061; May 14, 1982, PF4016; May 14, 1982, PF4017; Aug. 10, 1982, PF5314

Int. Cl.³ B04C *5/081*

U.S. Cl. 210—512.1 **31 Claims**



1. A cyclone separator comprising elements designed, sized and arranged for treating an oil-water mixture for separating the more dense water component from the less dense oil component thereof, said separator having a separating chamber with first, second and third contiguous cylindrical portions arranged in that order, the first cylindrical portion being of greater diameter than the second cylindrical portion and the third cylindrical portion being of lesser diameter than the second cylindrical portion, the second cylindrical portion being of a length which is at least ten times its diameter adjacent the first cylindrical portion, the first cylindrical portion having an overflow outlet at the end thereof opposite to said second cylindrical portion and at least one tangentially directed feed inlet, said separator further including means designed, sized and arranged for acting to preclude contamination of the water component emerging from the third cylindrical portion by said oil component, said means being in the form of a fourth portion of the separating chamber, which fourth portion presents a passageway for throughflow of said water component, the diameter of which passageway decreases away from said third cylindrical portion to a diameter in the range ½ to ¾ of the diameter of the fourth portion at the junction of said fourth portion with said third cylindrical portion.

14. A cylone separator comprising elements designed, sized and arranged for treating an oil-water mixture for separating the more dense water component from the less dense oil component thereof, said separator having a separating chamber with first, second and third contiguous cylindrical portions arranged in that order, the first cylindrical portion being of greater diameter than the second cylindrical portion and the third cylindrical portion being of lesser diameter than the second cylindrical portion, the second cylindrical portion being of a length which is at least ten times its diameter adjacent the first cylindrical portion, the first cylindrical portion having an overflow outlet at the end thereof opposite to said second cylindrical portion and at least one tangentially directed feed inlet, said separator further including means designed, sized and arranged for acting to preclude contamination of the water component emerging from the third cylindrical portion by said oil component, said means comprising a constriction at the end of the separating chamber opposite said overflow outlet, said constriction presenting a passageway for throughflow of said water component, the diameter of which passageway decreases away from said third cylindrical portion to a diameter in the range ½ to ¾ of the diameter of the passageway at the end of said constriction closest said third cylindrical portion.

16. A cyclone separator comprising elements designed, sized and arranged for treating an oil-water mixture for separating the more dense water component from the less dense oil component thereof, said separator having a separating chamber with first, second and third contiguous cylindrical portions arranged in that order, the first cylindrical portion being of greater diameter than the second cylindrical portion and the third cylindrical portion being of lesser diameter than the second cylindrical portion, the second cylindrical portion being of a length which is at least ten times its diameter adjacent the first cylindrical portion, the first cylindrical portion having an overflow outlet at the end thereof opposite to said second cylindrical portion and at least one tangentially directed feed inlet, said separator further including means designed, sized and arranged for acting to preclude contamination of the water component emerging from the third cylindrical portion by said oil component, said means being in the form of a fourth portion of the separating chamber, which fourth portion presents a passageway for throughflow of said water component, the diameter of which passageway decreases away from said third cylindrical portion to a diameter in the range of ½ to ¾ of the diameter of the fourth portion at the junction of said fourth portion with said third cylindrical portion, and the outlet is provided with means selectively operable to vary the cross-sectional area of said outlet for permitting clearing of a blockage when occurring in the outlet.

24. A cyclone separator comprising elements designed, sized and arranged for treating an oil-water mixture for separating the more dense water component from the less dense oil component thereof, said separator having a separating chamber with first, second and third contiguous cylindrical portions arranged in that order, the first cylindrical portion being of greater diameter than the second cylindrical portion and the third cylindrical portion being of lesser diameter than the second cylindrical portion, the second cylindrical portion being of a length which is at least ten times its diameter adjacent the first cylindrical portion, the first cylindrical portion having an overflow outlet at the end thereof opposite to said second cylindrical portion and at least one tangentially directed feed inlet, said separator further including means designed, sized and arranged for acting to preclude contamination of the water component emerging from the third cylindrical portion by said oil component, said means comprising a constriction at the end of the separating chamber opposite said overflow outlet, said constriction presenting a passageway for throughflow of said water component, the diameter of which passageway decreases away from said third cylindrical portion to a diameter in the range of ½ to ¾ of the diameter of the passageway at the end of said constriction closest said third cylindrical portion, and said outlet is provided with means selectively operable to vary the cross-sectional area of said outlet for permitting clearing of a blockage when occurring in the outlet.

4,464,265

VALVE DEVICE FOR STOCK/SAUCE SKIMMER AND THE LIKE

Auvin H. Joyner, 2 Walnut St., Pawling, N.Y. 12564

Filed Jun. 10, 1983, Ser. No. 503,237

The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.

Int. Cl.³ B01D *12/00*

U.S. Cl. 210—517 **7 Claims**

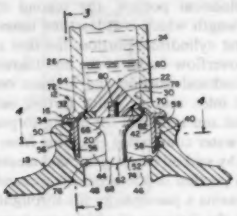
1. A valve device for stock/sauce skimmer and the like which comprises:

(a) a container in which is stored liquid to be separated from fats and solids contained in the liquid, said container having a cylinder at a lower portion thereof, the cylinder

forming a vertical first passage through which the liquid may flow;

(b) a sleeve fixedly mounted around the lower edge of the cylinder, said sleeve having upper and lower portions, the outer surface of the lower portion being provided with a plurality of projecting pins, the inner surface of said sleeve forming a vertical second passage coextensive with the first passage;

(c) a base forming a vertical central third passage having an inner surface adapted to receive the lower portion of said sleeve, the second passage and the third passage being coextensive, said base having a plurality of slots provided



on the inner surface adapted to engage with the pins, the third passage having a circumferential inner ledge; and

(d) valve means mounted upon the ledge for opening and closing the first passage when said container is rotated relative to said base so that when said container is raised relative to said base the first passage is lifted away from said valve means allowing flow of the liquid through the second and third passages and when said container is lowered relative to said base the first passage will engage with said valve means blocking flow of the liquid through the first passage whereby the separated liquid may be removed from said container at a controlled rate.

4,464,266

REMOVAL OF CAPROLACTAM AND ITS OLIGOMERS FROM COOLING WATER CONTAINING THESE COMPOUNDS

Hugo Strehler; Robert Kegel, both of Frankenthal; Guenter Valentin, and Werner Hoerauf, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 4, 1982, Ser. No. 385,270

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1981, 3126835

Int. Cl.³ C02F *1/24*

U.S. Cl. 210—703 **3 Claims**

1. A process for purifying the circulating cooling water that is used in a water bath to solidify polycaprolactam and which contains extracted caprolactam monomers and oligomers which consists essentially of: passing an effective amount of gaseous air, nitrogen or carbon dioxide into the cooling water to form a layer of foam on the water containing said monomers and oligomers, separating the foam containing said monomers and oligomers from the cooling water and recycling said cooling water to said water bath.

4,464,267

PREPARING FIRE-FIGHTING CONCENTRATES

Peter J. Chiesa, Jr., Pleasant Hill, Calif., and Edward C. Norman, Chester Springs, Pa., assignors to Enterra Corporation, Lionville, Pa.

Continuation-in-part of Ser. No. 17,858, Mar. 6, 1979, abandoned. This application Feb. 1, 1982, Ser. No. 344,875

Int. Cl.³ A62C *1/12*; A62D *1/04*; B01F *3/12*

U.S. Cl. 252—8.05 **13 Claims**

1. In the process of dissolving a thixotropic polysaccharide powder in water, the steps of first slurrying the polysaccharide in essentially water-free N-methyl-pyrollidone-2, to form a milky slurry essentially free of coarse particles and having from about ¼ to about 3 times as much N-methylpyrollidone-2 as polysaccharide, by weight, then stirring the slurry into an excess of water.

10. In the process of preparing a fire-fighting foam-forming concentrate for use with standard proportioning foamers to produce a foam that forms a mat on hydrophilic liquids, the steps of providing thixotropic mat-forming polysaccharide in powder form, then slurrying the powder in at least twice its weight of a glycol, polyglycol or monoalkyl ether of a glycol or polyglycol, having from six to ten carbon atoms in its molecule and in undiluted condition, to produce a slurry essentially free of coarse particles, and stirring the slurry into an excess of a body of water below the surface of the water to make a concentrate of a colloidal solution of the polysaccharide in essentially water.

4,464,268

METHOD FOR RESTORING PERMEABILITY OF INJECTION WELLS

Vernon H. Schievelbein, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 11, 1982, Ser. No. 338,775

Int. Cl.³ E21B *43/25, 43/27*

U.S. Cl. 252—8.55 B **7 Claims**

1. A method of restoring the permeability of a porous subterranean petroleum containing formation adjacent a well bore wherein organic or synthetic polymeric material and biological matter are lodged in the pores thus restricting the flow of aqueous fluids, the method comprising injecting into the formation through the well bore an aqueous solution consisting of water or brine wherein is dissolved from about 1% to about 30% by weight of hydrogen peroxide and from about 1% to about 30% by weight of an acid selected from the group consisting of hydrochloric, hydroflouric and acetic; and then allowing the well to remain quiescent for from 2 to 96 hours and then backflowing or displacing with an aqueous solution containing water or brine and from about 0.5% to about 3.0% by weight of sodium bisulfite.

4,464,269

ADDITIVE COMPOSITION FOR RELEASE OF STUCK DRILL PIPE

Thad O. Walker, Humble, and Patricia C. Matthews, Houston, both of Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

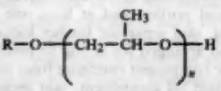
Continuation-in-part of Ser. No. 288,110, Jul. 29, 1981, Pat. No. 4,436,638, which is a continuation-in-part of Ser. No. 254,424, Apr. 15, 1981, abandoned. This application Apr. 19, 1982, Ser. No. 369,577

The portion of the term of this patent subsequent to Mar. 13, 2001, has been disclaimed.

Int. Cl.³ E21B *31/00*; C09K *7/06*

U.S. Cl. 252—8.55 R **8 Claims**

1. An improved method for releasing a differentially stuck drill string in the borehole of an underground formation during drilling operations employing a drilling fluid which comprises contacting said stuck drill string with an additive composition effective to reduce the annular pressure exerted by the drilling fluid against the stuck drill string, said additive composition being comprised of: from 5 to 18 weight percent of a mud dehydrating agent represented by the formula



wherein R represents an alkyl group of from 18 to 32 carbon atoms and n is an integer of from 35; from 8 to 20 weight

percent of an oil-soluble C_8–C_{22} fatty acid ester of a polyol or polyol anhydride emulsifier-wetting agent; from 0.05 to 0.5 weight parts of an oil soluble imidazoline supplemental emulsifier per weight part of said dehydrating agent; and, the balance a liquid hydrocarbon diluent.

4,464,270

METHOD AND COMPOSITIONS FOR FRACTURING SUBTERRANEAN FORMATIONS

Keith H. Hollenbeak, and Charles J. Githens, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Sep. 27, 1982, Ser. No. 423,577

Int. Cl.³ E21B *43/26*

U.S. Cl. 252—8.55 R **27 Claims**

1. An aqueous gel comprising:

an aqueous fluid comprising a water-alcohol solution having from about 0 to 80 percent alcohol by volume;

a gelling agent comprising a solvatable polysaccharide having a molecular weight in excess of about 100,000 present in an amount sufficient to gel said aqueous fluid;

a crosslinking agent soluble in said aqueous fluid comprising an organotitanate chelate present in an amount sufficient to crosslink at least a portion of said gelling agent; and

a retarding agent comprising at least one member selected from the group consisting of glycerol, erythritol, threitol, ribitol, arabinitol, xylitol, allitol, altritol, sorbitol, mannitol, dulcitol, iditol and perseitol capable of retarding the action of said crosslinking agent upon said gelling agent present in an amount sufficient to retard said crosslinking agent.

4,464,271

LIQUID OR SOLID FABRIC SOFTENER COMPOSITION COMPRISING MICROENCAPSULATED FRAGRANCE SUSPENSION AND PROCESS FOR PREPARING SAME

Marina A. Munteanu, New York; Christine Cseko, Purchase, both of N.Y.; Edward S. Oltarzewski, Mercerville, N.J.; Jerome I. Lindauer, Hillsdale, N.J., and Donald A. Withycombe, Lincroft, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 348,131, Feb. 11, 1982, Pat. No. 4,446,032, which is a continuation-in-part of Ser. No. 294,731, Aug. 20, 1981, Pat. No. 4,428,869. This application Nov. 30, 1983, Ser. No. 556,415

Int. Cl.³ D06M *13/00, 13/18*

U.S. Cl. 252—8.6 **11 Claims**

1. A process for preparing a fragranced fabric softener composition comprising (i) admixing (a) from about 1 up to about 10 parts by weight of a non-confined hydrophobic fragrance oil and (b) from about 0.1 up to about 10 parts by weight of a composition of matter selected from the group consisting of hydroxypropyl cellulose having a molecular weight of from about 50,000 up to about 800,000; xanthan gum, ethyl cellulose and silica thereby forming a first suspension; (ii) admixing said first suspension with from about 2 up to about 10 parts by weight of an entrapped fragrance oil, said fragrance oil capable of being released hydrolytically or by means of application of mechanical pressure, said fragrance oil being physically entrapped in a solid material selected from the group consisting of hydrolyzable polymer, gelatin, gum acacia, urea-formaldehyde polymers and modified food starch, said solid material having a particle size of from about 3 microns up to about 800 microns thereby forming a second suspension, said physically entrapped fragrance oil being organoleptically compatible with said non-confined hydrophobic fragrance oil; and (iii) admixing the resulting mixture with a fabric softener composition.

4,464,272

FABRIC SOFTENING COMPOSITION

Michael W. Parslow, Upton by Chester, and Edwin Willis, Wirral, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jan. 24, 1983, Ser. No. 460,715

Claims priority, application United Kingdom, Feb. 10, 1982, 8203883

Int. Cl.³ D06M *13/46*

U.S. Cl. 252—8.8 **5 Claims**

1. A low viscosity, liquid fabric softening composition comprising an aqueous base, from at least 0.5% to about 30% by weight of a cationic fabric softening agent and from more than about 10% to about 40% by weight of lanolin or a lanolin-like material, the composition characterized by a viscosity less than 150 cP measured at 25° C. and 110 sec^{-1} in a Haake viscometer.

4,464,273

FABRIC SOFTENING COMPOSITION

Michael W. Parslow, Upton by Chester, and Edwin Willis, Wirral, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jan. 24, 1983, Ser. No. 460,716

Claims priority, application United Kingdom, Feb. 10, 1982, 8203882

Int. Cl.³ D06M *13/46*

U.S. Cl. 252—8.8 **6 Claims**

1. A fabric softening composition comprising an aqueous base and a cationic fabric softening agent, wherein it further comprises

(i) from about 10% to about 40% lanolin or a lanolin-like material; and

(ii) an effective amount to control viscosity of a viscosity control agent selected from

(a) electrolytes;

(b) polymers as herein defined;

(c) C_{12}–C_{40} hydro-carbons and halogen derivatives thereof;

(d) C_9–C_{24} fatty acids;

(e) fatty acid esters of monohydric alcohols, the esters having a total of 10 to 40 carbon atoms;

(f) C_{10}–C_{18} fatty alcohols; and

(g) a water miscible solvent for said cationic softening agent;

the composition further characterized by a viscosity of between about 150 and about 250 cP measured at 25° C. and 110 sec^{-1} in a Haake Viscometer.

4,464,274

ORGANOPHILIC CLAY SUSPENDING AGENTS

Roy F. House, Houston, Tex., assignor to Venture Innovations, Inc., Lafayette, La.

Continuation-in-part of Ser. No. 292,408, Aug. 13, 1981, Pat. No. 4,382,868. This application May 4, 1983, Ser. No. 491,265

Int. Cl.³ C10M *5/20, 5/24*

U.S. Cl. 252—28 **16 Claims**

1. The method of producing an organoclay suspending agent which comprises extruding a mixture containing a clay selected from the group consisting of attapulgite, sepiolite, and mixtures thereof, from about 20 to about 60 milliequivalents per 100 grams of 100% active clay of a quaternary compound selected from the group consisting of quaternary ammonium salts, quaternary phosphonium salts, and mixtures thereof, from about 20% to about 59% by weight of water, and from about 1% to about 15% by weight of an alcohol containing from 1 to 5 carbon atoms, and thereafter grinding the organoclay gellant without removing the water or alcohol therefrom.

4,464,275

RUST PREVENTIVE OIL FOR A LOW FRICTIONAL TORQUE TAPERED ROLLER BEARING

Hiroyoshi Yasui, Osaka, Japan, assignor to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Sep. 27, 1982, Ser. No. 424,327

Claims priority, application Japan, Mar. 7, 1980, 55-29494

Int. Cl.³ C10M *1/48*

U.S. Cl. 252—32.7 E 5 Claims

1. A rust preventive oil for low frictional torque tapered roller bearings, comprising a base oil having a viscosity of from 10 to 20 centistokes at 40° C. which consists of from 70 to 80 percent by weight of a low viscosity mineral oil having a viscosity of from 8 to 12 centistokes at 40° C. and from 10 to 20 percent by weight of a high viscosity mineral oil having a viscosity of from 15 to 20 centistokes at 40° C., from 3 to 8 percent by weight of a barium sulphonate, from 3 to 8 percent by weight of a wax or ester thereof, from 1 to 3 percent by weight of an amine and a higher alcohol, from 0.1 to 0.8 percent by weight of 2,6-di-t-butyl-p-cresol, and from 3 to 10 percent by weight of zinc dialkyldithiophosphate.

4,464,276

POLYOXYALKYLENE POLYAMINE TRIAZOLE COMPLEXES

Rodney L. Sung, Fishkill, and Benjamin H. Zoleski, Beacon, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed May 6, 1983, Ser. No. 492,313

Int. Cl.³ C10M *1/32*

U.S. Cl. 252—42.7 6 Claims

1. Polyoxyalkylene polyamine complexes of the formula:

$$Z-[(OCH_2\underset{\displaystyle Y}{\underset{|}{C}}H)_n-B]_rA$$

wherein A is 5-aminotriazole or benzotriazole; Y is hydrogen, or a lower alkyl group having 1 to 5 carbon atoms; Z is a hydrocarbon radical having 2–10 carbon atoms forming from 1 to 4 external ether linkages; n is 1 to 15 and r is 1 to 4; B is NH_2 or ureido except that when Z is ureidoalkyl and B is ureido, r can only be 1.

4,464,277

SYNTHETIC LUBRICANT COMPOSITION

Thomas J. Cousineau, and John A. Cengel, both of Wheaton, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 25, 1982, Ser. No. 436,443

Int. Cl.³ C10M *1/26*

U.S. Cl. 252—56 S 8 Claims

1. Di-n-hexyl 1,3-cyclohexanedicarboxylate.

4,464,278

COMPOSITION FOR FORMING THICK MAGNETIC RECORDING MEDIUM

Ryuichi Funada, and Masato Nakaya, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

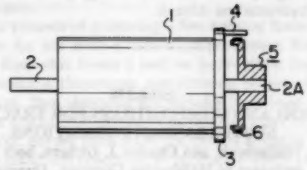
Filed Jul. 28, 1983, Ser. No. 518,111

Claims priority, application Japan, Aug. 4, 1982, 57-135238

Int. Cl.³ G11B *5/70, 5/68;* H01F *1/26*

U.S. Cl. 252—62.54 16 Claims

1. A composition for forming a thick magnetic recording medium comprising 70% by weight or less of magnetic particles and 30% by weight or more of a resin mixture of (a) an epoxy resin, (b) a phenol resin, and (c) polyvinyl butyral, the weight ratio of the phenol resin to the epoxy resin ((b)/(a)) being 2.5/7.5 to 4/6 and the weight ratio of the polyvinyl



butyral to the total of phenol resin plus epoxy resin ((c)/(a)+(b)) being 2.5/7.5 to 4/6.

4,464,279

MAGNETIC RECORDING MEDIUM

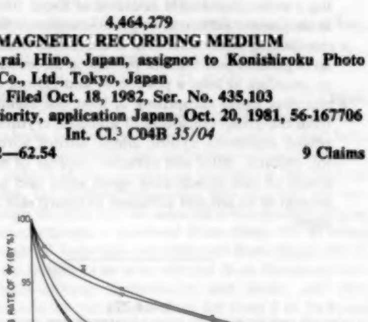
Mitutaka Arai, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1982, Ser. No. 435,103

Claims priority, application Japan, Oct. 20, 1981, 56-167706

Int. Cl.³ C04B *35/04*

U.S. Cl. 252—62.54 9 Claims



1. A magnetic recording medium having a non-magnetic support carrying a magnetic layer which layer comprises a ferromagnetic metallic powder, a binder material, and a nitrogen-containing compound which is capable of forming a complex with an iron ion and whose stability constant with said iron ion is not less than 15.

4,464,280

ORGANOLEPTIC USES OF PHENYL ETHYL METHYL CARBONATE MIXTURES

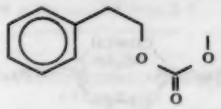
Richard M. Boden, Monmouth Beach; Theodore J. Tyszkiewicz, Sayreville, and Hugh Watkins, Lincroft, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 422,489, Sep. 23, 1982, which is a division of Ser. No. 329,221, Dec. 10, 1981, abandoned. This application Oct. 28, 1983, Ser. No. 546,390

Int. Cl.³ C11D *17/00*

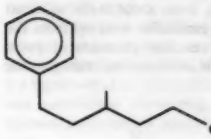
U.S. Cl. 252—174.11 3 Claims

1. A process for augmenting or enhancing the aroma of a perfumed article comprising the step of adding to said perfumed article an aroma augmenting or enhancing quantity of a mixture consisting essentially of phenylethyl methyl carbonate having the structure:

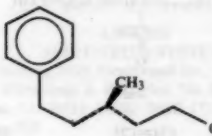


and at least one substance selected from the group consisting of:

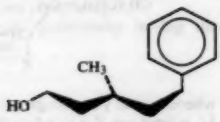
(i) 3-methyl-1-phenyl-pentenol-5 or stereoisomers thereof having a structure selected from the group consisting of:



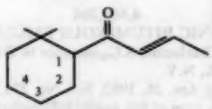
OH and



OH and;



(ii) at least one cyclohexyl butenone derivative defined according to the structure:



wherein one or two of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond with the proviso that when two of the dashed lines are carbon-carbon double bonds said carbon-carbon double bonds are conjugated.

2. The process of claim 1 wherein the perfumed article is a solid or liquid anionic, nonionic, cationic or zwitterionic detergent.

3. The process of claim 1 wherein the perfumed article is a fabric softener composition or a fabric softener article.

4,464,281

STABILIZED BLEACH-SENSITIVE DYES IN AUTOMATIC DISHWASHER DETERGENT COMPOSITIONS

Anthony Rapisarda, Elmhurst, N.Y.; Edilia Camps, Elizabeth, and Herbert Bauer, Saddle Brook, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Jul. 28, 1983, Ser. No. 518,248

Int. Cl.³ C11D *7/54, 7/56, 7/12, 17/06*

U.S. Cl. 252—174.21 **30 Claims**

1. An automatic dishwasher detergent powder comprising:

(a) from about 5% to about 70% of a builder;

(b) from about 1% to about 15% of a nonionic surfactant;

(c) from about 1% to about 20% of a silicate;

(d) from about 0% to about 60% of a filler;

(e) from about 0.001% to about 0.1% of a bleach-sensitive dye; and

(f) water;

wherein the composition is pre-conditioned by contact with a flow of air prior to the addition of a bleaching agent, said bleach present in an effective amount to clean dishes, affording a resultant powder whose color remains essentially unchanged even after storage for two months at elevated temperature.

4,464,282

ORGANIC MATERIALS

Kenneth J. Harrison; Edward P. Raynes, both of Malvern Link; Frances C. Saunders, Malvern Wells, and David J. Thompson, Whitefield, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britian and Northern Ireland, London, England

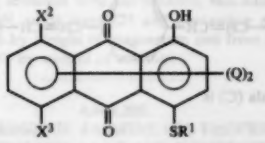
Continuation-in-part of Ser. No. 352,060, Feb. 24, 1982. This application Aug. 24, 1982, Ser. No. 411,095

Claims priority, application United Kingdom, Feb. 25, 1981, 8105959; Feb. 25, 1981, 8105961; Mar. 5, 1981, 8106995; Sep. 30, 1981, 8219530; Aug. 18, 1982, 8223855

Int. Cl.³ G02F *1/13;* **C09K** *3/34*

U.S. Cl. 252—299.1 **28 Claims**

1. A material adapted for use in a guest-host liquid crystal device which comprises a solution of a liquid crystal host material and a pleochroic dye dissolved in said host to an extent to adapt said material for said use, wherein the pleochroic dye comprises at least one anthraquinone compound free from water solubilizing and ionic substituents and having the formula:



wherein:

X^2 and X^3 are selected from OH and $—SR^2$

provided that

when X^2 is OH X^3 is $—SR^2$ and when X^3 is OH X^2 is $—SR^2$;

each Q is C_{1-20}-alkyl and adjacent to an OH group; and R^1 and R^2 are different and selected from alkyl, mono- or bi-cyclic aryl and cycloalkyl.

4,464,283

LIQUID CRYSTAL COMPOSITION

Shinji Hasegawa; Kazuhisa Toriyama, both of Mobara, Japan; Ludwig Pohl, Darmstadt, and Georg Weber, Erzhausen, both of Fed. Rep. of Germany, assignors to Hitachi, Ltd. and Merck Patent GmbH, both of Tokyo, Japan

Filed Jul. 8, 1982, Ser. No. 396,304

Claims priority, application Japan, Jul. 8, 1981, 56-105510

Int. Cl.³ C02F *1/13;* **C09K** *3/34*

U.S. Cl. 252—299.63 **6 Claims**

1. A liquid crystal composition comprising

29 to 36 mole % of trans-4-n-propyl-(4-ethylphenyl)-cyclohexane,

28 to 35 mole % of trans-4-n-pentyl-(4-cyanophenyl)-cyclohexane,

14 to 18 mole % trans-4-n-pentyl-(4'-ethylbiphenyl-4)-cyclohexane,

4 to 7 mole % of trans-4-n-pentyl-(4'-cyanobiphenyl-4)-cyclohexane,

3 to 7 mole % of 4-n-propylphenyl-4-(trans-4-n-propylcyclohexyl) benzoate, and

5 to 8 mole % of 4-(trans-4-n-pentylcyclohexyl)-4'-(trans-4-n-propylcyclohexyl) -biphenyl;

the total amount of trans-4-n-propyl-(4-ethylphenyl)-cyclohexane and trans-4-n-pentyl-(4-cyanophenyl)-cyclohexane being 64 mole % or more.

4,464,284

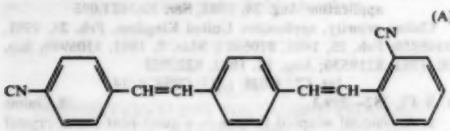
MIXTURES OF OPTICAL BRIGHTENERS

Guenther Seybold, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Division of Ser. No. 214,227, Dec. 8, 1980, Pat. No. 4,380,514.
This application Sep. 29, 1982, Ser. No. 428,339
Claims priority, application Fed. Rep. of Germany, Jan. 12, 1980, 3001065
Int. Cl.³ C09K *11/06*; C07C *119/048*
U.S. Cl. 252—301.21 4 Claims

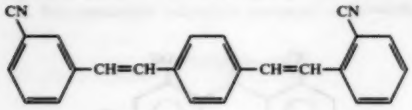
1. A mixture of optical brightener compounds consisting of a compound of formula (A)

(A)



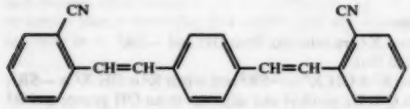
and at least one compound of formula (B) or (C) where formula (B) is

(B)



and formula (C) is

(C)



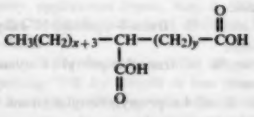
4,464,285

AMPHOTERICS AS EMULSIFIERS FOR BITUMINOUS EMULSIONS

Peter Schilling, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

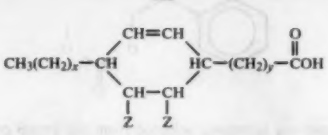
Filed May 17, 1982, Ser. No. 378,599
The portion of the term of this patent subsequent to Aug. 7, 2001, has been disclaimed.
Int. Cl.³ B01J *13/00*; C09D *3/24*; B01F *7/22, 7/28*
U.S. Cl. 252—311.5 19 Claims

1. Amphoteric emulsifiers for anionic and cationic bituminous emulsions consisting of reaction products of polyamines reacted with polycarboxylic acids corresponding to the formulae



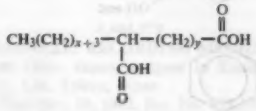
-continued

and

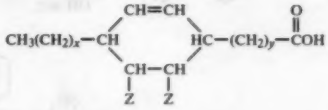


wherein x and y are integers from 3 to 9, x and y together equal 12, at least one Z is a carboxylic acid group and any remaining Z is hydrogen.

5. A bituminous emulsion comprising from about 30% to about 80% by weight of bitumen, from about 0.1% to about 10% by weight of an amphoteric emulsifier selected from the group consisting of amphoteric reaction products of polyamines reacted with polycarboxylic acids corresponding to the formulae



and



wherein x and y are integers from 3 to 9, x and y together equal 12, at least one Z is a carboxylic acid group and any remaining Z is hydrogen, and water to make up 100% by weight, the emulsion having a pH in the range of from 2 to 12.

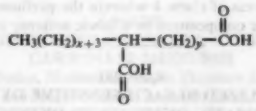
4,464,286

CATIONIC BITUMINOUS EMULSIONS

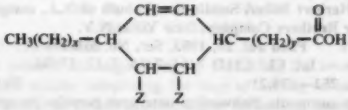
Peter Schilling, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

Filed Apr. 26, 1982, Ser. No. 371,720
The portion of the term of this patent subsequent to Aug. 7, 2001, has been disclaimed.
Int. Cl.³ B01J *13/00*; C09D *3/24*
U.S. Cl. 252—311.5 11 Claims

1. A cationic bituminous emulsion comprising from about 30% to about 80% by weight of bitumen, from about 0.1% to about 10% by weight of an emulsifier selected from the group consisting of reaction products of polyamines reacted with the polycarboxylic acids corresponding to the formulae



and



wherein x and y are integers from 3 to 9, x and y together equal

12, at least one Z is carboxylic acid group and any remaining Z is hydrogen, and water to make up 100% by weight, the emulsion having a pH in the range of from 2–7.

4,464,287

SUSPENSIONS CONTAINING MICROFIBRILLATED CELLULOSE

Albin F. Turbak, Convent Station; Fred W. Snyder, Wharton, both of N.J., and Karen R. Sandberg, Shelton, Wash., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 202,740, Oct. 31, 1980, Pat. No. 4,378,381. This application Nov. 15, 1982, Ser. No. 441,550

Int. Cl.³ A23D *5/02;* **B01J** *13/00*

U.S. Cl. 252—312 **3 Claims**

1. A suspension of a finely divided material in a liquid suspending medium which swells cellulose, said suspension being in the form of an emulsion in which the finely divided material is a liquid which is immiscible in the liquid suspending medium, said suspension containing microfibrillated cellulose in an amount sufficient to produce a stable, homogeneous suspension.

4,464,288

EMULSIFIER SYSTEM

Herbert L. Sanders, 2020 Swainwood Dr., Glenview, Ill. 60022

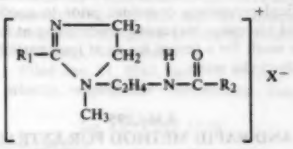
Filed Aug. 8, 1983, Ser. No. 521,031

Int. Cl.³ B01J *13/00;* **B01F** *17/16, 17/28*

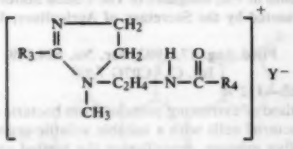
U.S. Cl. 252—312 **6 Claims**

1. A cationic emulsifier system for producing stable oil-in-water micro-emulsions, said system comprising:

blends of difatty imidazolinium quaternaries having the following structural formulae:



and



wherein each of R_1, R_2 is a saturated fatty acid residue of chain length 7 to 15 and R_3, R_4 are C_{17} unsaturated fatty acid residues, and X and Y are water-soluble anions.

4. The method of preparing stable cationic imidazolinium quaternary micro-emulsion systems having HLB ranges of between about 8 and about 12, said method comprising:

reacting diethylene triamine with a source of C 7–15 chain saturated fatty acids selected from the group consisting of coconut oil fatty acids, palm kernel oil fatty acids, lauric acid and mixtures thereof to form a first difatty imidazole ring compound,

treating said first imidazole ring compound with a quaternizing agent selected from the group consisting of methyl chloride, dimethyl sulfate, and diethyl sulfate to provide a first difatty acid imidazolinium quaternary,

reacting diethylene triamine with a source of C 17 chain unsaturated fatty acids selected from the group consisting of oleic acid, linoleic acid, and unsaturated fatty acids derived from soya oil, safflower oil, and tallow, and mixtures thereof, to form a second difatty imidazole ring compound,

treating said second imidazole ring compound with a quaternizing agent selected from the group consisting of methyl chloride, dimethyl sulfate, and diethyl sulfate to provide a second difatty acid imidazolinium guaternary, and

blending said first imidazolinium quaternary and said second imidazolinium quaternary in a ratio of between 5 to 95 parts by weight to 95 to 5 parts by weight to provide an HLB between about 8 and about 12.

4,464,289

SUPER-ALKALINIZED DETERGENT-DISPERSANT ADDITIVES FOR LUBRICATING OILS AND METHOD OF MAKING SAME

Jean-Louis Le Coent, Le Havre, and Bernard Demourés, Puteaux, both of France, assignors to Orogil, Courbevoie, France

Filed Jun. 22, 1983, Ser. No. 506,775

Claims priority, application France, Jun. 24, 1982, 82 11058

Int. Cl.³ C10M *1/40*

U.S. Cl. 252—33.4 **20 Claims**

1. A lubricating oil additive prepared according to a method comprising the steps of:

(a) carbonating a reaction medium until a sediment weight of less than about 1.5% by weight (referred to the weight of the reaction medium) is obtained, the medium comprising a magnesium alkylbenzenesulfonate having a T.B.N. up to about 20, a sulfurized alkylphenol, a dilution oil, and a milk of magnesia mixture comprising active magnesium oxide, a glycol, and an amine;

(b) adding lime to the carbonated medium to neutralize and super-alkalinize the sulfurized alkylphenol present in the medium;

(c) removing glycol from the medium; and

(d) removing sediment from the medium; said additive having a T.B.N. of at least 225 and containing more than about 3.8% by weight of magnesium and from about 2% to about 3% by weight of calcium.

4,464,290

HYPO-ALLERGENIC JASMINE OIL PROCESS FOR PRODUCING THE SAME AND COMPOSITION CONTAINING THE SAME

Saburo Ohta, Tokyo; Shoji Nakamura, Yokohama; Katsutake Hayashi, Tokyo; Katsuyuki Yomogida, Sagamihara; Hideo Morohoshi, Yokohama; Seiichi Hirose, Yokohama; Keiichi Uehara, Yokohama; Masanori Aizawa, Yokohama; Yoshihisa Sato, Yokohama; Hideyuki Ichikawa, Matsumoto; Masayuki Tejima, Tokyo, and Seisaku Togano, Chigasaki, all of Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

Filed Mar. 22, 1982, Ser. No. 360,290

Int. Cl.³ A61K *7/46;* **C11B** *9/00*

U.S. Cl. 252—522 R **4 Claims**

1. Hypo-allergenic jasmine oil from which coniferyl benzoate and coniferyl acetate are removed.

4,464,291

PROCESS FOR ENHANCING OR AUGMENTING THE AROMA OF PERFUME COMPOSITIONS, COLOGNES AND PERFUMED ARTICLES USING NORBORNYL DIESTERS

Mark A. Sprecker, Sea Bright, and Patrick Whelan, Matawan, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

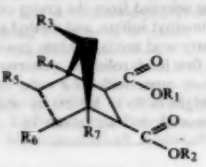
Filed May 5, 1983, Ser. No. 492,038

Int. Cl.³ C11B *9/00*

U.S. Cl. 252—522 R **12 Claims**

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of adding to said consumable material, an

aroma augmenting or enhancing quantity of at least one compound defined according to the structure:



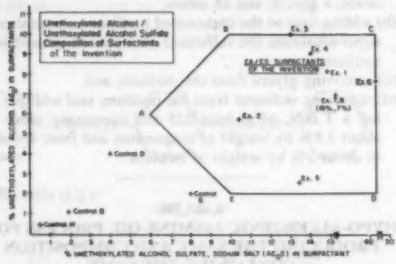
wherein R_1 and R_2 are the same or different, C_1–C_3 lower alkyl; wherein one of R_3, R_4, R_5, R_6 and R_7 is methyl and the other of R_3, R_4, R_5, R_6 and R_7 is hydrogen; and wherein the dashed line represents a carbon-carbon single bond or a carbon-carbon double bond.

4,464,292

MIXED ETHOXYLATED ALCOHOL/ETHOXY SULFATE SURFACTANTS AND SYNTHETIC DETERGENTS INCORPORATING THE SAME

Stephen P. Lengyel, 456 Steeplechase La., Bridgewater, N.J. 08807

Filed Jan. 2, 1981, Ser. No. 222,076
Int. Cl.³ C11D *1/83, 3/08*
U.S. Cl. 252—532 **10 Claims**



1. A process for the preparation of mixed ethoxylated alcohol/ethoxy sulfate surfactant, which comprises:

(a) contacting with concentrated sulfuric acid an initial mixture of

(i) ethoxylated alcohols having the formula

$$R—O—(CH_2CH_2O)_nH,$$

wherein R is alkyl having from 12 to 18 carbon atoms, or alkylaryl the alkyl moiety of which has from 8 to 10 carbon atoms, and n represents the average number of ethoxylate groups in said alcohols and is a number from 1 to 12; and

(ii) unethoxylated alcohols R—OH, wherein R is as defined hereinabove, said unethoxylated alcohols comprising from 8 to 50% by weight of the initial mixture, so as to partially sulfate from about 50 to 80% by weight of the ethoxylated and unethoxylated alcohol moieties; and

(b) neutralizing the partially sulfated mixture to produce a neutralized mixture containing an ethoxylated alcohol/ethoxy sulfate blend with the unethoxylated alcohols in an amount of from 2 to 10% by weight of the neutralized mixture and the unethoxylated alcohol sulfates in the salt form in an amount of from 6 to 42.4% by weight of the neutralized mixture, in the proportions defined within the pentagonal region ABCDE in the accompanying drawing.

4,464,293

LIQUID CLEANER-DISINFECTANT COMPOSITION FOR USE IN WIPING DOWN DENTAL OPERATORIES

Robert J. Dobrin, 4 Nancy La., Framingham, Mass. 01701

Filed Apr. 12, 1982, Ser. No. 367,285
Int. Cl.³ C11D *1/62*
U.S. Cl. 252—547 **2 Claims**

1. A liquid composition for use in wiping down nondisposable surfaces in a dental operatory consisting essentially of:

a. between about 50 and 91% volume of a C_1–C_4 alcohol,

b. between about 0.5 and 1.5% by volume of a skin emollient,

c. Between about 0.19 and 2.5% by volume of a scent,

d. between about 0.3 and 1.5% by volume of a cationic detergent,

e. between about 0.5 and 8% by volume of a nonionic detergent, and

f. the remainder up to 100% by volume of water.

4,464,294

PROCESS FOR THE STABILIZATION OF RADIOACTIVE WASTES

Dietrich Thiele, Niederzier-Hambach, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Julich, Fed. Rep. of Germany

Filed Jul. 29, 1982, Ser. No. 402,908
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131276
Int. Cl.³ G21F *9/16*
U.S. Cl. 252—629 **11 Claims**

1. In a process for the stabilization of radioactive wastes in a glass matrix, wherein a glass smelt enriched with the radioactive waste is solidified through cooling; the improvement comprising contacting a thinly-fluid glass smelt at a maximal temperature of 1200° C. together with the radioactive waste within a final repository container prior to cooling thereof, with a solid viscosity- increasing oxide along at least the surface of the smelt for a period for an at least partial dissolution of the oxide in the smelt.

4,464,295

SIMPLE AND RAPID METHOD FOR EXTRACTION OF PROTEINS FROM BACTERIA

Saumya Bhaduri, Warminster, and Paul H. Demchick, Penn Valley, both of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 17, 1983, Ser. No. 524,179
Int. Cl.³ C07G *7/00*
U.S. Cl. 260—112 R **3 Claims**

1. A method of extracting proteins from bacteria comprising treating bacterial cells with a suitable volatile organic solvent for about five minutes, centrifuging the treated cells and the solvent to collect the cells, removing the volatile residues from the collected cells with a stream of inert gas, and extracting the proteins from the cells with an aqueous phase solvent.

4,464,296

SOLUBILIZATION OF DRY PROTEIN IN AQUEOUS OR ACIDIC MEDIA AFTER TREATMENT WITH CONCENTRATED HYDROGEN PEROXIDE

Thomas J. Jacks; Thomas P. Hensarling, both of New Orleans, and Linda L. Muller, Lake Charles, all of La., assignors to The United States of America as represented by Secretary of Agriculture, Washington, D.C.

Filed Oct. 7, 1983, Ser. No. 539,860
Int. Cl.³ A23J *1/14*
U.S. Cl. 260—123.5 **8 Claims**

1. A process for increasing the solubility of dry purified oilseed protein comprising:

(a) treating the protein with sufficient H_2O_2 to increase the solubility of the protein;

(b) isolating the solubilized protein from the mixture.

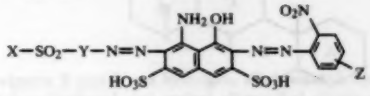
4,464,297

FIBER REACTIVE BISAZO DYE HAVING BOTH A VINYLSULFONE TYPE REACTIVE GROUP AND AN ORTHO-NITROPHENYL GROUP

Takashi Omura, Ashiya; Naoki Harada, and Yasuo Tezuka, both of Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 14, 1982, Ser. No. 398,223
Claims priority, application Japan, Jul. 29, 1981, 56-119950
Int. Cl.³ C09B *62/513, 62/533;* D06P *1/384, 3/66*
U.S. Cl. 260—185 8 Claims

1. A compound represented by a free acid of the formula,



wherein X is —CH=CH$_2$ or —CH$_2$CH$_2$R (R is a group capable of being split off with an alkali); Y is phenylene or naphthylene, said phenylene being unsubstituted or substituted by 1–3 identical or different substituent(s) selected from C$_1$–C$_4$ alkyl, C$_1$–C$_4$ alkoxy, chlorine and bromine, and said naphthylene being unsubstituted or substituted by 1–3 sulfonic acid group(s); and Z is hydrogen, halogen, nitro, cyano, C$_1$–C$_4$ alkyl or C$_1$–C$_4$ alkoxy.

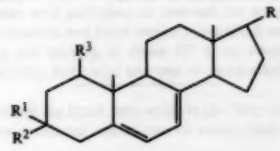
4,464,298

METHOD OF PREPARING Δ5,7-STEROIDS

Menso P. Rappoldt; Louis F. Pauli, and Jan Hoogendoorn, all of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Filed Jan. 11, 1983, Ser. No. 457,191
Claims priority, application Netherlands, Jan. 14, 1982, 8200128
Int. Cl.³ C07J *17/00*
U.S. Cl. 260—239.55 C 25 Claims

1. A method of preparing Δ5,7-steroids, in particular 7-dehydrocholesterol compounds, of the general formula:



wherein

R is selected from the group consisting of a hydrogen atom, a hydroxy group selected from the group consisting of a free hydroxy group, an etherified hydroxy group with a C$_1$–C$_4$ alkanol, and an esterified hydroxy group with a C$_1$–C$_4$ alkane carboxylic acid, a C$_2$–C$_5$ alkanoyl group, and a C$_1$–C$_{10}$ aliphatic hydrocarbyl group, and

R^1,R^2 and R^3 are equal or different and are selected from the group consisting of hydrogen atoms, hydroxy groups, and a C$_2$–C$_4$ alkylene dioxy group,

by dehydrobrominating 7-bromo-Δ5-steroids under the influence of a base in an organic solvent, characterized in that a fluoride is used as a base, said fluoride being selected from the group consisting of an alkali metal fluoride, an alkaline earth metal fluoride, and a tetra(hydrocarbyl)ammonium fluoride, the hydrocarbyl groups of which each comprise from 1 to 15 carbon atoms.

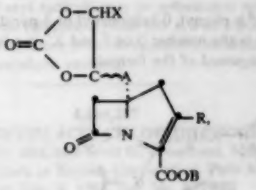
4,464,299

ANTIBACTERIAL CARBAPENEM COMPOUNDS

Shoichiro Uyeo, Kyoto, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

Filed Apr. 20, 1982, Ser. No. 370,260
Claims priority, application Japan, Apr. 24, 1981, 56-62784
Int. Cl.³ A61K *31/40;* C07G *487/04*
U.S. Cl. 260—245.2 T 16 Claims

1. A carbapenem compound of the formula



wherein

A is hydrogen or 1 to 3C alkyl,

B is a conventional carboxy-protecting ester conventional in the beta-lactam chemistry or alkali metal or alkaline earth metal salt group,

R is hydrogen, hydroxy, 1 to 3C alkyl, 1 to 3C alkylthio, 1 to 3C alkylsulfinyl, 3 to 6C alkanoylaminoalkylthio, 3 to 6C alkanoylaminoalkylsulfinyl, 4 to 7C alkanoylaminoalkenylthio or 4 to 7C alkanoylamino alkenylsulfinyl,

X is hydrogen or 1 to 3C alkyl, and

the wave line shows either R or S bond.

4,464,300

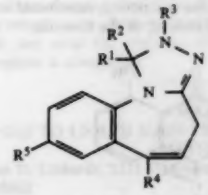
TRIAZOLO BENZAZEPINES

René Borer, , assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 15, 1982, Ser. No. 398,481
Claims priority, application Switzerland, Aug. 12, 1981, 5201/82
Int. Cl.³ A61K *31/55;* C07D *487/04*
U.S. Cl. 260—245.5 9 Claims

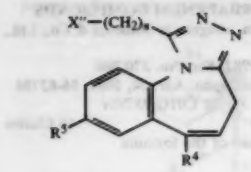
1. A compound of the formula

I



wherein either R^1 is hydrogen, lower alkyl, 4-pyridyl or the group —(CH$_2$)$_n$—NR^{6}R^7 and R^2 and R^3 together are an additional bond or R^1 and R^2 together are the oxo group and R^3 is hydrogen or lower alkyl, R^4 is phenyl, 0-halophenyl or 2-pyridyl, R^5 is halogen or nitro and either R^6 is hydrogen or lower alkyl and R^7 is hydrogen, lower alkyl, lower alkenyl or lower alkynyl or R^6 and R^7 together with the nitrogen aton are 4-(lower alkyl)-1-piperazinyl or 4-morpholinyl and n is the number 0 or 1, and pharmaceutically acceptable acid addition salts thereof.

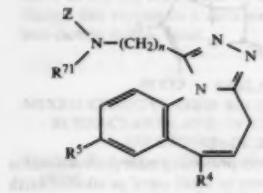
8. A compound of the formula



V

wherein R^4 is phenyl, 0-halophenyl or 2-pyridyl, R^5 is halogen or nitro, n is the number 0 or 1 and X'' is a leaving group.

9. A compound of the formula



VII

wherein R^4 is phenyl, 0-halophenyl or 2-pyridyl, R^5 is halogen or nitro, n is the number 0 or 1 and either Z is a protecting group and R^{71} is hydrogen, lower alkyl, lower alkenyl or lower alkynyl or Z and R^{71} together are a protecting group.

4,464,301

1,8-DIHYDROXY-9-ANTHRONES DERIVATIVES SUBSTITUTED IN THE 10-POSITION BY AN UNSATURATED RADICAL AND THEIR USE IN HUMAN AND VETERINARY MEDICINE

Ibraham Shroot, Antibes; Jean Maignan, Tremblay les Gonesse, and Gérard Lang, Epinay sur Seine, all of France, assignors to Groupement d'Intéret Economique Centre International de Recherches Dermatologiques C.I.R.D., Valbonne, France

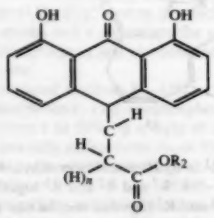
Filed Feb. 8, 1982, Ser. No. 346,893

Claims priority, application France, Feb. 10, 1981, 81 02572

Int. Cl.[3] **C07C** *50/18;* **A61K** *31/12*

U.S. Cl. 260—351 **13 Claims**

1. A 1,8-dihydroxy-9-anthrone compound, substituted in the 10-position by an unsaturated radical, of the formula:



wherein R_2 represents hydrogen, linear or branched chain alkyl of 1 to 6 carbon atoms, cycloalkyl of 4 to 6 carbon atoms or benzyl, and

n is 0 or 1

and mixtures thereof.

4,464,302

17-[(HYDROXYMETHYL)FORMAMIDO-METHYLENE]-STEROIDS

Lucien Nedelec, Le Raincy, and Vesperto Torelli, Maisons-Alfort, both of France, assignors to Roussel Uclaf, Paris, France

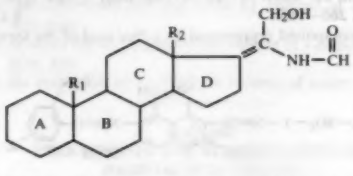
Filed Jul. 28, 1980, Ser. No. 173,172

Claims priority, application France, Jul. 31, 1979, 79 19653

Int. Cl.[3] **C07J** *3/00*

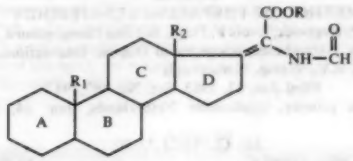
U.S. Cl. 260—397.1 **19 Claims**

1. 17-[(hydroxymethyl)formamido-methylene]-steroids of the formula



wherein R_1 is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms optionally substituted with a member selected from the group consisting of halogen, hydroxy and amino, and alkenyl and alkynyl of 2 to 4 carbon atoms, R_2 is alkyl of 1 to 4 carbon atoms and the A,B,C and D rings may contain one or more double bonds and are optionally substituted with at least one member of the group consisting of hydroxy, keto, halogen, alkyl and alkoxy of 1 to 4 carbon atoms and alkenyl and alkynyl of 2 to 4 carbon atoms.

16. A compound of the formula



II

wherein R_1, R_2, A,B,C and D have the definitions of claim **1** and R is alkyl of 1 to 18 carbon atoms, except ethyl (20E) 20-formamido-3-methoxy-19-nor-$\Delta^{1,3,5(10),17(20)}$-pregnatetraene-21-oate.

4,464,303

MANUFACTURE OF HIGHER ARYL ESTERS CROSS-REFERENCE TO RELATED APPLICATIONS

Anil B. Goel, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Sep. 13, 1982, Ser. No. 416,809

Int. Cl.[3] **C11C** *3/02;* **C09F** *5/08*

U.S. Cl. 260—410 **9 Claims**

1. An oxidation process for the manufacture of higher aryl esters comprising contacting the reaction mixture of a higher aromatic hydrocarbon selected from the group consisting of naphthalene, anthracene, biphenyl, phenanthrene, and terphenyls, an organic solvent, a carboxylic acid and molecular oxygen in the liquid phase at a temperature in the range of from 100° to 300° C., with a catalyst composed of a palladium carboxylate, an antimony carboxylate and optionally a carboxylate of at least one metal selected from the group consisting of chromium and manganese.

4,464,304

VINYL CYCLOPROPYL COMPOUNDS AS PRECURSORS TO FATTY ACID OXIDATION PRODUCTS

Ned A. Porter; Carl B. Ziegler, Jr., and David H. Roberts, all of Durham, N.C., assignors to Duke University, Durham, N.C.

Division of Ser. No. 181,833, Aug. 27, 1980. This application Jun. 30, 1982, Ser. No. 393,732

Int. Cl.³ C09F 5/08, 7/10; C11C 3/00

U.S. Cl. 260—410 10 Claims

1. A method of synthesizing a nucleophile substituted unsaturated hydrocarbon based compound, comprising:

reacting a compound of the formula:

wherein R and R′ are hydrogen, alkyl, alkenyl, cycloalkyl, cycloalkenyl, aryl, aralkyl, alkoxyalkyl, alkoxy, alkylthioalkyl, carboxyalkyl, carboxyalkenyl, and X is a leaving group selected from the group consisting of chlorine, bromine and iodine with a nucleophilic reagent selected from the group consisting of an amine, an organosulfide, an alkoxide, or an organohydroperoxide.

4,464,305

PROCESS FOR THE RECOVERY OF FATTY ACIDS FROM DISCARDED SOLID SOAP MATERIALS

Charles H. Patrick, Jr., P.O. Box 1926, Greenville, S.C. 29602

Filed Sep. 23, 1982, Ser. No. 421,975

Int. Cl.³ C09F 5/00; C11B 1/00

U.S. Cl. 260—412 12 Claims

1. A process for the recovery of fatty acids from discarded solid soap material, comprising the steps of:

(a) disolving discarded solid soap material into a melt of one or more fatty acids at about 40° C. to about 180° C. until the soap material has dissolved in the fatty acid melt,

(b) adding to the thus-produced solution of soap material in the fatty acid melt an amount of an undiluted organic or inorganic acid sufficient to convert the soap material to free fatty acids and form one or more alkali metal salts and heating and stirring at about 40° C. to about 180° C. to produce free fatty acid and one or more alkali metal salts; and

(c) separating the freed fatty acids in the fatty acid melt from the thus-produced salt of one or more alkali metals.

4,464,306

COORDINATION COMPLEXES OF OPTICALLY ACTIVE PHOSPHINE COMPOUNDS

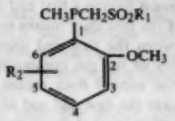
William C. Christopfel, Oakland, Calif., and William S. Knowles, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 213,272, Dec. 5, 1980, Pat. No. 4,376,870. This application Jan. 19, 1983, Ser. No. 459,275

Int. Cl.³ C07F 15/00

U.S. Cl. 260—429 J 15 Claims

1. An optically active metal coordination complex capable of catalyzing the asymmetric hydrogenation of olefins, comprising rhodium and two moles, per mole of rhodium, of phosphine ligand of the formula



wherein R_1 is an alkyl, aryl or dialkylamino radical; R_2 is hydrogen or an alkyl, aryl, Cl, Br, I, F or sulfone radical; any of said alkyl and aryl radicals may be substituted with Cl, Br, I, F and/or sulfone radicals; R_2 is in the 3, 4 or 5 position; and R_1 and R_2 do not interfere with the necessary solubility properties or with the catalytic process.

4,464,307

SUBSTITUTED ACID CHLORIDE PROCESS

Ted A. Baer, Palo Alto, and Scott G. Broadbent, Milpitas, both of Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Nov. 8, 1982, Ser. No. 439,738

Int. Cl.³ C07C 51/60

U.S. Cl. 260—544 N 5 Claims

1. A process for preparing 2-N-(2-chloro-4-trifluormethylphenyl)amino-3-methylbutyroyl chloride comprising the steps of:

(a) reacting 2-N-(2-chloro-4-trifluoromethylphenyl)amino-3-methylbutyric acid with phosgene in the presence of a catalytically effective amount of a water-soluble tertiary amide in an aliphatic or aromatic hydrocarbon solvent having a boiling point of from 35° to 140° C. at a temperature of from −10° to +10° C. until 2-N-(2-chloro-4-trifluoromethylphenyl)amino-3-methylbutyroyl chloride is formed in the reaction mixture; and

(b) extracting the reaction mixture with water at a temperature of from −10° C. to +10° C. to remove impurities.

4,464,308

PROCESS FOR PREPARING DIMETHYL β,β-DICHLOROVINYLPHOSPHATE

Antonie A. den Braber, Putten, Netherlands, assignor to Denka Chemie B.V., Vorrthuizen, Netherlands

Filed Jun. 21, 1982, Ser. No. 390,692

Claims priority, application Netherlands, Jul. 6, 1981, 8103227

Int. Cl.³ C07F 9/40

U.S. Cl. 260—969 3 Claims

1. A process for preparing dimethyl β,β-dichlorovinylphosphate comprising the steps of partially reacting chloral with trimethylphosphite at atmospheric pressure and at a temperature not exceeeding 150° C., and thereafter heating the mixture at a temperature of between 150°-210° C. for at least 25 seconds and until the reaction of said chloral and trimethylphosphite is completed.

4,464,309

GAS TO LIQUID MASS TRANSFER DEVICE AND METHOD

Hans D. Linhardt, 1221 W. Coast Hwy., Newport Beach, Calif. 92663

Filed May 14, 1982, Ser. No. 388,140

Int. Cl.³ B01F 3/04

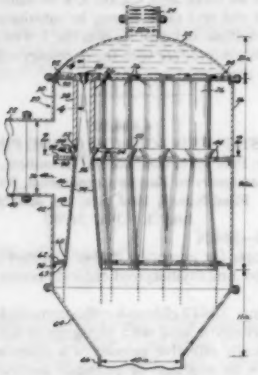
U.S. Cl. 261—23 R 19 Claims

1. An apparatus for exposing a gas composition to a liquid composition for temporarily intimately mixing said compositions for the purpose of effectuating mass or energy transfer between said compositions, the apparatus comprising:

first elongated duct means for providing a conduit for a substantially dispersed stream of the liquid composition, said first duct means having a first end;

second elongated duct means disposed substantially coaxially with the first duct means for providing a conduit for

a mixed stream of the liquid and gas compositions, the second duct means having a first end disposed adjacent to the first end of the first duct means so as to provide a gas inlet port between the first and second duct means for permitting entry of the gas composition into the second duct means, the second duct means including a throat disposed adjacent the first end and an outwardly expanding diffuser section located downstream from the throat, the throat diameter being less than ten inches;



liquid injecting means operatively associated with the first duct means for injecting said liquid composition into the first duct means, for dispersing said liquid composition into droplets, for causing said droplets to travel substantially along the longitudinal axes of the first and second duct means and for providing a momentum range of the liquid droplets in the gas composition to the throat diameter of the second duct means of between 0.10 and 1.0; and

collecting means operatively associated with the second duct means for collecting said liquid composition and said gas composition from said second duct means.

4,464,310

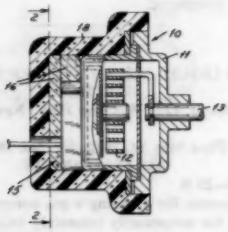
INSULATED CAP AND HEAT SINK FOR AUTOMATIC CHOKE CONTROL

Charles A. Detweiler, Durand, Mich., assignor to Tom McGuane Industries, Inc., Madison Heights, Mich.

Filed Sep. 24, 1982, Ser. No. 423,461

Int. Cl.³ F02M *1/12*

U.S. Cl. 261—39 E **1 Claim**



1. In an automatic choke control which includes a housing having a side wall and an end wall, a bimetallic coil in said housing having an output linkage for connection to a choke to move the choke toward a closed position when the temperature of the engine is low and to move the choke toward an open position when the temperature of the engine rises, the improvement comprising

a body of porous material impregnated with a material such as paraffin that is normally solid and becomes liquid at an elevated temperature,

said body engaging said end wall of said housing,

an insulating cap of foam plastic material substantially surrounding the major portion of said housing overlies the body and frictionally engaging said housing for retaining said body on the exterior of the end wall of said housing so that it functions as a heat sink to store thermal energy in the solid material converting the material to a liquid.

4,464,311

VARIABLE VENTURI-TYPE CARBURETOR

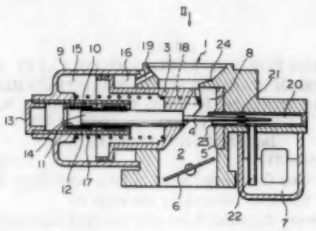
Norihiko Nakamura; Takaaki Itoh; Takashi Katou, all of Mishima; Yozo Ota, Chiryu, and Toshiharu Morino, Mie, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisin Industry Co., Ltd., both of, Japan

Filed Sep. 29, 1982, Ser. No. 426,831

Claims priority, application Japan, Dec. 28, 1981, 54-209792

Int. Cl.³ F02M *9/06*

U.S. Cl. 261—44 C **6 Claims**



1. A variable venturi-type carburetor comprising:

an axially-extending intake passage formed in the carburetor;

a suction piston transversely movable in said intake passage in response to a change in the amount of air flowing within said intake passage, said suction piston having a tip face which defines the venturi-portion in said intake passage and a needle-mounting face;

a fuel passage extending transversely and being open to said intake passage;

a metering jet arranged in said fuel passage;

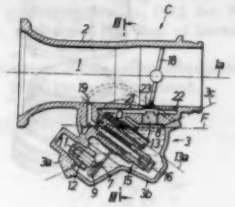
a needle fixed onto the needle-mounting face of said suction piston and extending through said fuel passage and said metering jet, the tip face of said suction piston having a projecting tip face portion which is located upstream of said needle and projects transversely from said needle-mounting face towards said venturi portion; and

a groove having upstream and downstream portions formed on said projecting tip face portion and extending along the axis of said intake passage, the upstream portion of said groove having a U-shaped cross section and being open to said intake passage located upstream of said suction piston and the downstream portion of said groove being connected to said needle-mounting face and having a bottom which is inclined toward said needle-mounting face from said upstream portion, said projecting tip face portion having an approximately V-shaped cross section which expands from said groove towards said venturi portion.

4,464,312
CARBURETOR FOR INTERNAL COMBUSTION ENGINES

Katsuyuki Zaita, Kawagoe, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1982, Ser. No. 397,369
Claims priority, application Japan, Jul. 10, 1981, 56-107108
Int. Cl.³ F02M *5/02*
U.S. Cl. 261—70 **4 Claims**

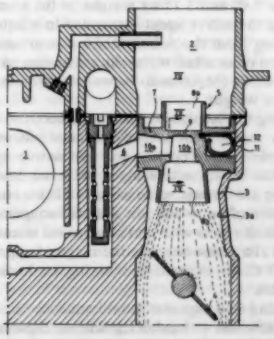


1. In an improved carburetor for internal combustion engines, including an intake cylinder having an intake passage therein, a float chamber projecting sidewardly from said intake cylinder and capable of being filled with fuel therein, a float member provided in said float chamber and adapted to be displaced in accordance with the change in the surface level of the fuel therein, a float valve operatively connected with said float member to open and close in response to displacements of the float member to maintain the fuel surface at a constent level, and a main fuel passage and a low-speed fuel passage adapted to introduce the fuel in the float chamber into said intake passage, respectively, the improvement wherein said main and low-speed fuel passages are inclined with respect to the axis of said intake passage and arise from below the surface of fuel in the float chamber, said float member is arranged to be displaceable in a direction parallel with the axis of said low-speed fuel passage, and the center of the surface of fuel in said float chamber is located substantially on the axis of said low-speed fuel passage.

4,464,313
CARBURETTOR

Yves Martineau, Pontchartrain, France, assignor to Societes Anonymes: Automobiles Citroen et Automobiles Peugeot, Paris, France

Continuation of Ser. No. 327,236, Dec. 3, 1981, abandoned. This application Nov. 21, 1983, Ser. No. 553,876
Claims priority, application France, Dec. 15, 1980, 80 26853
Int. Cl.³ F02M *7/02*
U.S. Cl. 261—78 R **3 Claims**



1. In a carburettor having a combustion-air passageway extending from an intake to a discharge side thereof, an air-gasoline emulsion passageway opening laterally into said combustion-air passageway, and a throttle valve in said combustion-air passageway downstream of said emulsion passageway, the improvement which consists of a one-piece center emulsion tube comprising:

an internally and externally axially extending cylindrical upstream tubular portion disposed with all-around clearance in said combustion-air passageway for partitioning air flow therethrough into an outer flow and an inner flow,

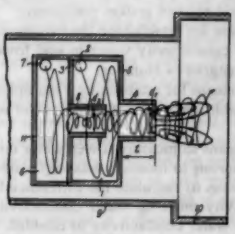
a radial tubular portion extending across said inner flow downstream of said cylindrical tubular portion and communicating with said emulsion passageway and opening axially in a downstream direction centrally within said inner flow, and

an internally and externally axially extending frustoconical portion of constant wall thickness downstream of said radial portion and diverging in said downstream direction for discharging a mixture of said inner flow and an air-gasoline emulsion divergently over substantially the full cross section of said combustion-air passageway in the region thereof provided with said throttle valve, said combustion-air passageway being provided between said emulsion passageway and said throttle valve with a frustoconically diverging diffuser and said frustoconical portion diverging with an angle substantially the same as the divergence of said diffuser.

4,464,314
AERODYNAMIC APPARATUS FOR MIXING COMPONENTS OF A FUEL MIXTURE

Vitaly F. Surovikin, ulitsa Lermontova, 20, kv. 80; Vladimir F. Antonenko, Kamerny pereulok, 46, kv. 61; Gennady V. Babich, ulitsa 20 let RKKA, 40, kv. 15; Mikhail Y. Bobrik, ulitsa Chekhova, 3, kv. 102; Nikolai K. Korenyak, Kamerny pereulok, 52, kv. 39; Vasily V. Novikov, ulitsa 22 aprelya, 14a, kv. 36; Gennady A. Voloshin, ulitsa Magistralnaya, 7, kv. 6; Georgy A. Belyaev, 3 Molodezhnaya, 56, kv. 24, all of Omsk; Alexandr V. Gordeev, prospekt Kanatchikov, 58, kv. 12; Nail I. Gallyamov, prospekt Kanatchikov, 30, kv. 12, both of Volgograd, and Anatoly F. Krikunenko, 48, zavod tekhnicheskogo ugleroda, obschezhitie, Syzran, all of U.S.S.R.

Filed Jan. 2, 1980, Ser. No. 109,168
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—79 A **2 Claims**



1. An aerodynamic apparatus for mixing components of a fuel mixture, comprising:

a first cylindrical chamber for swirling the flow of a gaseous component of said fuel mixture;

at least one pipe for admission of a gaseous component arranged in direct proximity to an end wall of said first cylindrical chamber tangentially to the cylindrical surface;

a first pipe for removal of a gaseous component of said fuel mixture arranged in the other end wall of said cylindrical chamber coaxially therewith;

a second cylindrical chamber for swirling the flow of a

gaseous component of said fuel mixture arranged coaxially with said first cylindrical chamber;

at least one pipe of said second cylindrical chamber for admission of a gaseous component of said fuel mixture arranged in direct proximity to an end wall of the chamber tangentially to the cylindrical surface;

an opening in said end wall of said first cylindrical chamber coaxial therewith;

a second pipe for removal of a gaseous component of said fuel mixture arranged in said opening in such a manner that its end is within said first cylindrical chamber;

the ratio of diameters d_1/d_2 of said first and second pipes for removal of gaseous components of said fuel mixture ranging from 1 to 3; and

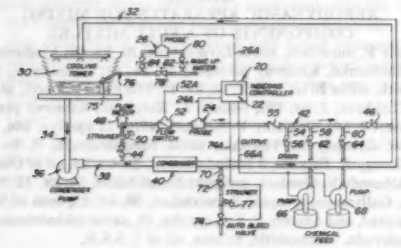
a pipe having a perforated nozzle for admission of a liquid or solid component arranged in an opening of the end wall of said second cylindrical chamber, the end of the pipe being spaced at a distance of $(0.1–3)d_1$ from the end of said first pipe for removal of components.

4,464,315

INDEXING CONTROLLER SYSTEM AND METHOD OF AUTOMATIC CONTROL OF COOLING WATER TOWER SYSTEMS

Richard P. O'Leary, Wayne, Pa., assignor to Betz Entec, Inc., Horsham, Pa.

Filed Dec. 20, 1982, Ser. No. 451,356
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—110 10 Claims



1. A control system for a cooling tower having a source of make-up water having a variable conductivity from a low to a high value, said control system comprising:

(1) first means for establishing the maximum conductivity of said low conductivity water in said tower at a predetermined Langelier's Number,

(2) second means for establishing a multiplier value based on said variable make-up waters and tower waters conductivities,

(3) third means to measure tower water conductivity,

(4) fourth means to measure make-up water conductivity,

(5) fifth means to calculate the difference between the low conductivity make-up water conductivity and measured make-up water conductivity to establish a baseline value,

(6) sixth means to multiply said baseline value by said multiplier to establish a delta value indicative of the required change in tower water conductivity to maintain the predetermined Langelier's number,

(7) seventh means to add said delta value to said maximum conductivity of said low conductivity water in the tower at said predetermined Langelier's number to produce a control value for the conductivity of the tower water, thereby maintaining said predetermined Langelier's number, and

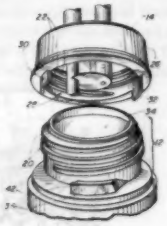
(8) eighth means responsive to said control value for controlling bleeding and replacement water in said tower to maintain said control value.

4,464,316

NON-REFILLABLE HUMIDIFIER CONTAINER

Thomas L. Michaels, Wonder Lake, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jul. 23, 1982, Ser. No. 401,297
Int. Cl.³ B01F *3/04*
U.S. Cl. 261—121 R 17 Claims



9. A closure system for a non-refillable container, said container including a neck defining a container outlet and said neck being externally threaded, and a cap having internal threads carried in rotatable threaded cooperation with the threads on the neck, the improvement comprising:

said container neck defining at least one locking lug extending upwardly from said container neck; and,

said cap defining a skirt having an open end, and said cap having at least one inlet connection through an end wall of said cap, said skirt having at least one camming ramp terminating at an end stop for camming said locking lug over said end stop, said camming ramp projecting from the open end of said skirt, whereby rotation of said cap is prevented only by contact of said lug with said end stop when said cap is attempted to be removed.

4,464,317

METHOD OF ENCAPSULATING ACTIVE AGENTS WITH INORGANIC COATINGS

Curt Thies, Ballwin, and Francis W. Linek, Affton, both of Mo., assignors to The Washington University, St. Louis, Mo.

Continuation-in-part of Ser. No. 116,043, Jan. 28, 1980, abandoned. This application Mar. 24, 1982, Ser. No. 361,387
Int. Cl.³ B01J *13/02;* A01N *25/28;* A61K *9/26*
U.S. Cl. 264—4.3 18 Claims

1. The method of encapsulating an active agent with an inorganic coating which comprises the steps of:

forming (a) a suspension containing the active agent suspended in a solution of an alkali metal silicate having an SiO_2 to alkali metal oxide (M_2O) ratio between approximately 1.60 and 3.75 by weight or (b) a suspension containing the active agent suspended in a liquid coacervate resulting from the addition of a coacervation agent to a solution of an alkali metal silicate having an SiO_2 to alkali metal oxide (M_2O) ratio between approximately 1.60 and 3.75 by weight;

contacting the suspension with an aqueous solution of a salt which reacts with said alkali metal silicate to form an insoluble silicate coating for said active agent whereby capsules of the active agent with an insoluble silicate coating are formed, said insoluble silicate coating having a thickness of up to 100 μm and said aqueous solution of a salt which reacts with said alkali metal silicate being maintained at a temperature in the range of approximately 50° C.–85° C. to expedite the curing or hardening of said capsules;

maintaining said capsules in said aqueous salt solution for a time sufficient to harden the silicate capsules; and

isolating the capsules;

thereafter drying the capsules,

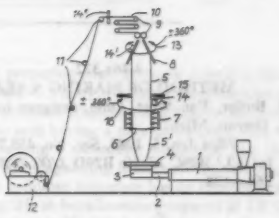
said capsules being characterized by having the active agent substantially uniformly dispersed throughout.

4,464,318

METHOD OF CONTROLLING THE FILM THICKNESS AT A BLOWN FILM INSTALLATION

Hartmut Upmeier; Gerd Klinge, and Gerhard Winkler, all of Lengerich, Fed. Rep. of Germany, assignors to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Continuation of Ser. No. 214,733, Dec. 9, 1980, Pat. No. 4,339,404. This application Jun. 21, 1982, Ser. No. 390,543
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1980, 3002903
The portion of the term of this patent subsequent to Jul. 13, 1999, has been disclaimed.
Int. Cl.³ B29D *23/04*
U.S. Cl. 264—40.1 **6 Claims**



1. A method for controlling the film thickness of a blown film extruder installation, the installation comprising a nozzle ring for extruding film divided into correcting sectors provided with adjustable temperature controlled units for controlling the respective temperatures of the correcting sectors, a film calibrating device, and a take-off and coiling apparatus for the film, said method comprising:

measuring thicknesses over the circumference of the extruded film;

forming film sectors of equal circumferential length corresponding to the number of correcting sectors;

assuming that a reference film sector having maximum or minimum thickness has been extruded in a correct circumferential position, allocating the succeeding film sectors in sequence to a selected film sector with maximum or minimum thickness;

assigning the values of a first set of correcting commands, which are derived from a measured mean thickness of the film sectors defining a measure for the correcting command, to the corresponding correcting sectors such that the correcting sector of the reference film sector with maximum or minimum thickness receives no correcting command while the succeeding correcting sectors receive correcting commands formed by respective departures ($\Delta\bar{s}_x$) of the mean thickness distributions of the associated film sector from the means thickness distribution of the reference film sector which forms a reference value;

cooling the correcting sectors if the reference value is a maximum thickness and heating the correcting sectors if the reference value is a minimum thickness; and

after performing at least one measuring and correcting cycle as recited by the foregoing steps, generating a second set of correcting commands associated with said correcting sectors based on updated departures ($\Delta\bar{s}_x$) between the means thickness distributions and said reference value, adding or subtracting said updated departures to or from said first set of correcting commands thereby to derive said second set of correcting command, and applying said second set of correcting commands to said correcting sectors thereby to obtain a more uniform thickness distribution among said film sectors.

4,464,319

METHOD OF AND APPARATUS FOR THE COILING OF FLATTENED SYNTHETIC RESIN FOIL TUBES

Hartmut Halter, Ruppichteroth, and Willi Schnell, Cologne, both of Fed. Rep. of Germany, assignors to Reifenhäuser GmbH & Co. Maschinenfabrik, Troisdorf, Fed. Rep. of Germany

Filed Aug. 5, 1982, Ser. No. 405,605
Int. Cl.³ B29D *23/04*
U.S. Cl. 264—40.1 **5 Claims**

1. In a method of operating a foil blowing and coiling apparatus comprising:

a foil blowing head adapted to blow a tube of a synthetic resin material to produce the foil in the form of said tube, said tube being flattened into a web, and

a coiling device receiving said web at a constant rate and coiling same in a multiplicity of turns with the turns being coiled in layers with increasing coiling time for successive layers, said head being formed with a periodically displaceable member adapted to sweep any thickness defect at an angular velocity around the foil tube as it is formed so that said thickness defect will form an arc pattern on said web spread across the latter, the improvement wherein said method comprises the step of:

reducing the angular velocity of said member with increase of the number of turns of said web on said coil to maintain the product of the angular velocity of said member, the radius at which said flaw is formed on said tube and the time required to form a turn of said web on said coil substantially constant for a multiplicity of successive turns so that said arc pattern is maintained constant for said multiplicity of successive turns.

5. In an apparatus for the production of a coil of synthetic resin foil material comprising a blowing head for blowing a tube of synthetic resin foil material and including an angularly displaceable member for sweeping any thickness flaw angularly about said tube at an angular velocity and with a radius, said tube being flattened into a web, and means for coiling said web in a multiplicity of turns with progressively increasing coiling times, the improvement which comprises:

means responsive to the increase in the number of turns on said coil for reducing said angular velocity to maintain the product of said angular velocity, said radius and the coiling time substantially constant for a multiplicity of turns.

4,464,320

REACTION INJECTION MOLDING SYSTEM FOR EXPANDED SYNTHETIC ARTICLES

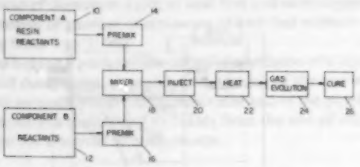
Glen W. Saidla, Stratham, N.H., assignor to Whitney & Company, Inc., Stratham, N.H.

Continuation-in-part of Ser. No. 111,664, Jan. 14, 1980, Pat. No. 4,358,548. This application Aug. 10, 1981, Ser. No. 291,399

The portion of the term of this patent subsequent to Feb. 8, 2000, has been disclaimed.

Int. Cl.³ B29D *27/00*

U.S. Cl. 264—45.3 **13 Claims**



1. A method of forming a reinforced synthetic article of polyester resin by injection of a mixture into a closed mold and allowing it to react therein;

comprising combining a set of reactants to form a mixture which includes

a major base mass of polyester resin in fluid form, at least one polyester cure accelerator, a selected quantity of isocyanate, a surfactant and an additive highly exothermically reactive with at least one component of said set,

said polyester cure accelerator comprising organic hydroperoxide,

said reactants in said mixture being substantially free of hydrogen peroxide,

said isocyanate being present in sufficient quantity to react to generate carbon dioxide throughout said mixture to cause said mixture to fill said mold and to prevent shrinkage thereof, and

said additive comprising a compound highly exothermically reactive with said isocyanate,

injecting the resultant mixture into a mold prior to substantial reaction,

said reactants in said mixture being balanced

to cause said additive to react highly exothermically with a portion of said isocyanate,

to trigger and accelerate said isocyanate to react with at least said organic hydroperoxide to evolve said carbon dioxide gas at least soon after said injection to generate pressure to expand said polyester base resin mass and maintain said pressure

and thereafter, after less than about three minutes following combining of said reactants, to cause a gellation reaction of said accelerator with said polyester resin to gel and solidify the expanded resin in pressured state, to form an expanded article.

4,464,321

PROCESS FOR THE PREPARATION OF CHITOSAN FIBERS

Francesco Pittalis; Francesco Bartoli, both of Rome, and Guido Giovannoni, S. Giuliano Milanese, all of Italy, assignors to Anic S.p.A., Palermo, Italy

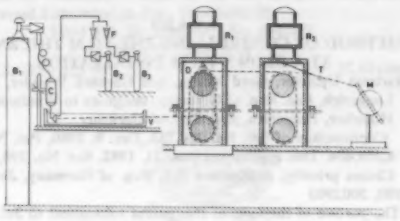
Filed Oct. 7, 1982, Ser. No. 433,282

Claims priority, application Italy, Oct. 8, 1981, 24398 A/81

Int. Cl.³ D02G *3/00*

U.S. Cl. 264—83 **5 Claims**

1. A process for preparing hollow chitosan fibres usable in ultrafiltration and dialytic processes, having a size of between 0.1 and 1 mm. and a thickness of between 0.005 and 0.025 mm. said process comprising wet spinning an acid solution of chitosan through a suitable hollow fibre spinneret, and using an alkali solution as the external fibre coagulant and a gaseous



phase containing a basic gaseous component as the internal fibre coagulant.

4,464,322

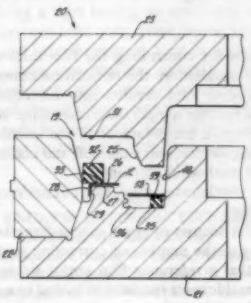
METHOD OF MAKING A SEAL

John D. Butler, Van Wert, Ohio, assignor to Federal-Mogul Corp., Detroit, Mich.

Filed Jan. 5, 1983, Ser. No. 455,782

Int. Cl.³ B29C *17/10;* **B29D** *3/00;* **B29G** *1/00*

U.S. Cl. 264—138 **14 Claims**



1. A method for making a seal having a sealing lip portion lined with a low friction material and a body made of an elastomeric material comprising the steps of:

placing a rigid annular case in a mold;

placing a first ring of uncured elastomeric material in said mold on one side of said case;

placing a second ring of uncured elastomeric material in the mold at a location radially spaced from said case, said second ring being disposed adjacent an axially opposite side of said case from said first elastomeric ring;

placing an annular wafer of low friction material on one side of said second ring;

closing and heating the mold to cause said first ring to bond to said one side of the case and flow both away from the annular wafer across said one side to fill a first portion of the mold and toward the second ring;

bonding said wafer to the second ring as said second ring flows along the wafer toward the first ring filling a second portion of the mold;

joining the first ring and the second ring at a location between said case and said wafer to form an integral body; and

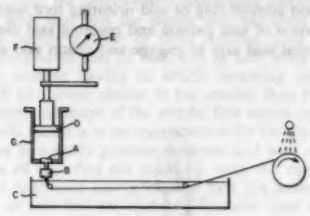
maintaining said mold at a temperature sufficient to substantially cure the first and second rings of uncured elastomeric material.

4,464,323

PROCESS FOR PREPARING HIGH STRENGTH CELLULOSIC FIBERS

John P. O'Brien, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 9, 1982, Ser. No. 406,533
Int. Cl.³ D01F 2/00
U.S. Cl. 264—187 9 Claims



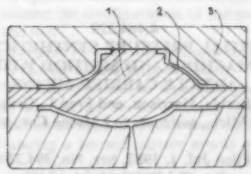
1. Process for preparing high strength cellulose triacetate fibers having at least 42.5% by weight acetyl groups by extruding a solution of cellulose triacetate in a solvent mixture comprising an organic acid having a pKa of no more than 3.5 and another solvent having a molecular weight of less than 160 through an inert noncoagulating fluid layer into a coagulating bath wherein the cellulose triacetate has an inherent viscosity of at least 5 (0.5 g/dL in hexafluoroisopropanol at 30° C.), the polymer concentration is 30–42% by weight, and the mol ratio of organic acid to the other solvent is 0.3 to 3.0.

4,464,324

APPARATUS AND METHOD FOR INJECTION MOULDING OF PLASTIC PARTS OF IRREGULAR SHAPE, HOLLOW OR UNDERCUT FORM

Daniel Hager, Saone et Loire, France, assignor to Ozen, France

Filed Sep. 21, 1981, Ser. No. 304,406
Int. Cl.³ B29C 1/08
U.S. Cl. 264—221 11 Claims



1. A method for injection molding hollow, irregularly shaped or undercut parts, the method comprising the steps of:

making a core from a material having a first predetermined melting point temperature;

cooling said core to a first predetermined temperature in a freezing means such that the temperature of said core at the actual time of the injection operation is between approximately −20° C. and −40° C.,

placing said core within an injection cavity of a mold;

injecting a liquid plastic material having a second predetermined melting point temperature higher than said first predetermined melting point temperature into said injection cavity so as to be substantially surrounding said core, said core providing a heat sink to draw the heat out of said liquid plastic material such that said liquid plastic material solidifies to form a solidified plastic part with the surface finish of the surface of said solidified plastic part immediately surrounding said core being significantly enhanced and whereby a thin film of air is formed on the outer surface of said core;

removing said core and solidified plastic part from said injection cavity within said mold; and

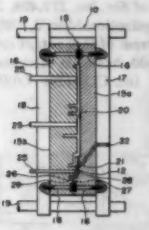
heating said core to said first predetermined melting point temperature such that said core is melted away from said solidified plastic part.

4,464,325

METHOD OF PRODUCING MULTI-KEY STRUCTURE FOR KEYBOARD MUSICAL INSTRUMENTS

Masao Kondo, and Shinji Kumano, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 14, 1982, Ser. No. 368,802
Claims priority, application Japan, Apr. 14, 1981, 56-55851
Int. Cl.³ B29D 3/00
U.S. Cl. 264—229 7 Claims



1. A method of producing a multi-key structure for keyboard musical instruments which comprises the steps of:

(a) filling a cavity of mold means with a molding material to form a molded structure which has a proximal end portion and a plurality of juxtaposed key portions extending from said proximal end portion, the respective adjacent key portions being connected with each other at said proximal end portion and diverging toward their free ends; and

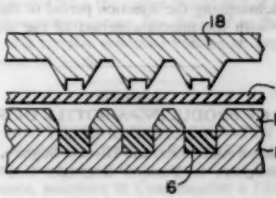
(b) removing said molded structure from said mold means and deforming said proximal end portion in such a manner that said plurality of key portions are brought into parallel relation to one another to provide the multi-key structure.

4,464,326

METHOD OF MANUFACTURING CONTACT RUBBER STRUCTURE

Toshihiro Nishihira, Tokyo, Japan, assignor to Fuji Rubber Co. Ltd., Japan

Filed Sep. 24, 1982, Ser. No. 423,154
Claims priority, application Japan, Feb. 15, 1982, 57-21174
Int. Cl.³ B29C 17/00; B29F 1/12
U.S. Cl. 264—246 3 Claims



1. A method of manufacturing a contact rubber structure, comprising the steps of:

injecting colored rubber materials into a plurality of cavities of a first mold member for molding a plurality of key top portions, said rubber being vulcanizable into a hard condition,

placing over said key top portions a second mold member

for molding key sheet portions to be connected to the key top portions said second mold member having at least one through aperture mold cavity vulcanizable to a lower hardness than that of the material of each of said key top portions between the first and second mold members;

compressing portions of the sheet material into said second mold member and against the key top portions and heating the sheet material and key top portions sufficiently to vulcanize the sheet material and key top portions together to form the contact rubber structure.

4,464,327

INJECTION MOLDING OF THERMOPLASTICS IN SANDWICH MOLD EMPLOYING DESYNCHRONIZED INJECTION PERIODS

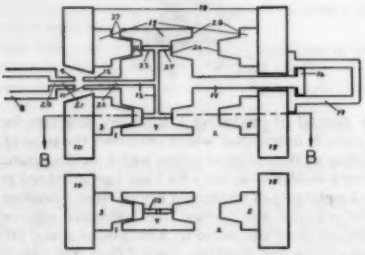
Jens O. Sorensen, P.O. Box 2274, Rancho Santa Fe, Calif. 92067

Continuation-in-part of Ser. No. 275,408, Jun. 19, 1981, Pat. No. 4,400,341. This application Mar. 3, 1983, Ser. No. 471,772

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.³ B29F *1/00*

U.S. Cl. 264—328.8 **11 Claims**



1. A method of cyclic injection molding a thermoplastic material, utilizing a combination of a sandwich mold and an injection unit which together encompass a bifurcated feed system with a molten core, the feed system comprising partly a channel system encompassed by the injection unit and partly a runner system encompassed by the sandwich mold, the feed system defining, a first branch for feeding a first cooling cavity encompassed by a first parting surface, and a second branch for feeding a second cooling cavity encompassed by a second parting surface, wherein each cooling cavity passes through a retracted period and a protracted period which together make up its production cycle, wherein the retracted period includes an injection period and a cooling period, and wherein the protracted period includes an opening period and a closing period, the method being characterized by the step of:

(a) desynchronizing the injection period of the first cooling cavity with the injection period of the second cooling cavity.

4,464,328

METHOD OF PRODUCING A BOTTLE OF SATURATED POLYESTER RESIN

Yataro Yoshino; Akiho Ota, and Hiroaki Sugiura, all of Tokyo, Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 82,698, Oct. 9, 1979, abandoned. This application Aug. 13, 1982, Ser. No. 407,868

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—521 **4 Claims**

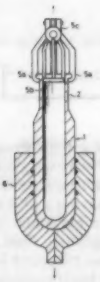
1. A method of producing a bottle of saturated polyester resin from an injection molded parison by biaxially orienting said parison, comprising:

forming a parison of saturated polyester resin by injection molding to have a barrel portion and a neck portion extending along a longitudinal axis to produce a neck portion thinner than said barrel portion and terminating in an annular land surrounding said neck portion;

positioning the barrel portion of said parison in a holder to retain said barrel portion;

selecting an orienting tool having an arm, an annular ring projecting from said arm, and a plurality of clamping palms pivotally coupled to said arm for pivotal movement with respect to said annular ring;

inserting said annular ring of said orienting tool within the neck portion of said parison and pivoting said clamping palms about said arm to engage and clamp said annular land;



heating only the neck portion of said parison to an orientable temperature;

moving said arm such that the clamping palms engaging said annular land move parallel to the longitudinal axis of said parison to orient said neck portion by pulling it along the longitudinal axis of said parison while said neck portion is heated;

heating the barrel portion of said parison to a biaxially orientable temperature; and

blow-molding said heated barrel portion in a mold to produce a saturated polyester resin bottle from said parison.

4,464,329

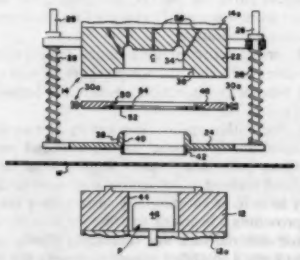
DIFFERENTIAL PRESSURE SYNTHETIC PLASTIC FORMING MACHINE AND METHOD WITH FORMED ARTICLE CARRIER MEANS

Robert C. Whiteside, Harrison, and Fred L. Greynolds, Beaverton, both of Mich., assignors to Leesona Corporation, Beaverton, Mich.

Filed Jul. 1, 1982, Ser. No. 394,258

Int. Cl.³ B29C *17/04, 17/08*

U.S. Cl. 264—544 **18 Claims**



1. In a differential pressure forming machine for forming cavity shaped articles in a web of thermoplastic material, said machine including web conveying means for advancing a web

of thermoplastic material in step-by-step movement to a work station, mold means at said work station movable between an open and a closed position relative to said web in synchronism with the movement of said web by said web conveying means, said mold means including a first die assembly, means on said first die assembly defining an article forming cavity therein into which a portion of said web is displaced during the article forming operation, and means on said mold means for severing the article from the web upon the completion of the formation of the article; the improvement comprising carrier means associated with said first die means and including a resiliently flexible carrier member of sheet material lying in a general plane parallel to that of said web at said work station, said carrier member having an article receiving opening therethrough of a shape similar to but smaller than the transverse cross-sectional shape of the article, first means operable when said mold means is in its open position for locating said carrier member in a ready position between said web and at least a portion of said first die assembly with the opening therein aligned with said cavity of said first die assembly, second means on said first die assembly operable upon movement of said mold means to its closed position to engage and flex said carrier member around the periphery of said opening to expand said opening to a size larger than said cross-sectional shape of said article while said mold means is closed, said second means being operable upon subsequent opening of said mold means to release said carrier member to cause said carrier member to resiliently grip the article within said opening, said first means being operable upon the arrival of said mold means at its open position for shifting said carrier member from said ready position with the article gripped therein to a discharge position clear of said mold means.

18. A method of differential pressure forming cavity shaped articles in a deformable, moldable first thermoplastic web section which is fed between openable and closable forming and trimming mold members, one of which has an article forming cavity, and wherein an article carrier is sandwiched between said mold members on one side of said web and has successively disposed carrier article gripper means comprising the steps of:

a. relatively moving the mold members from separated toward closed position while said carrier is situated between the mold members and while applying a differential pressure on opposite sides of the web to cause the web to move to assume the configuration of the cavity and form a part in the web;
b. Severing the part formed the web and gripping the part with a first carrier article gripper means;
c. moving the mold members to separated position;
d. advancing the carrier to move the gripped part from between the mold members to a part collection station while advancing a second carrier article gripper means; and
e. advancing a new web section between the mold members while removing the web section formerly between the mold members.

4,464,330

APPARATUS FOR IRRADIATING A CONTINUOUSLY FLOWING STREAM OF FLUID

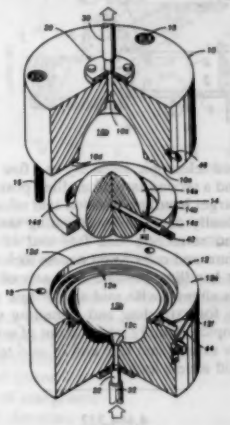
Leslie G. Speir, Espanola, and Edwin L. Adams, Jemez Springs, both of N. Mex., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed May 13, 1982, Ser. No. 377,898
Int. Cl.³ G21G *1/06*
U.S. Cl. 376—159 **4 Claims**

1. An apparatus for uniformly irradiating a flowing fluid, comprising:

a housing having a substantially spherical cavity, said housing consisting of two mutually opposing housing blocks each formed of a neutron moderating material, each of said blocks having a planar face and a semispherical concave cavity opening onto said planar face, means for clamping said blocks together with said planar faces opposing one another and with said semispherical cavities centered on and opposing one another so as to form said spherical cavity within said housing, said housing blocks having respective fluid flow inlet and outlet conduits which open onto said spherical cavity at diametrically opposite positions, a first one of said blocks including an annular recess in the planar face of said first block, said annular recess being centered on and surrounding the opening of the semispherical cavity in said first block; and

a moderator including a spherical ball integrally connected to an encircling circular support ring by a plurality of support members, said support ring being sized and shaped to cooperably fit in said annular recess of said first housing block, and with said ball having a diameter smaller than the diameter of said spherical cavity of said housing, said support members extending radially outwardly from said ball to said support ring, with said ball, said support members and said support ring all being formed integrally of a neutron moderating material, whereby said moderator and said housing form an annular spherical volume between the ball of said moderator and said housing through which a fluid can be passed, said moderator including an internal bore extending radially from the center of said ball through one of said support members and through said support ring, and with said first housing block including a bore extending from said annular recess to the outside of said housing, said bore of said first housing block and said bore in said moderator being alignable so as to permit a radiation source to be inserted in and removed from the center of said ball of said moderator without interrupting the flow of a fluid passing through said annular spherical volume or breaching the containment of the fluid.



4,464,331

TRANSFER AND POSITIONING APPARATUS FOR THE IRRADIATION OF TARGETS

Christian Bezer, Savigny-sur-Orge, and Michel Rouet, Orsay, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

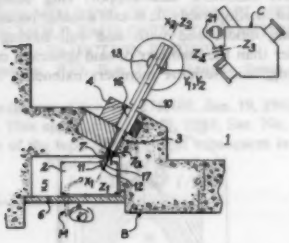
Filed Jul. 8, 1981, Ser. No. 281,399
Claims priority, application France, Jul. 10, 1980, 80 15404
Int. Cl.³ G21C *19/20*
U.S. Cl. 376—202 **5 Claims**

1. An apparatus for transferring and positioning a target in a highly evacuated irradiation installation including an access lock having an axis and which is secured to said highly evacuated irradiation installation, a shielded wall, said shielded wall

defining a protective enclosure and said highly evacuated irradiation installation being positioned within said protective enclosure, comprising:

a telescopic assembly having an axis and which is positioned within said protective enclosure and wherein said telescopic assembly further comprises a free end for carrying said target; and

a support having mounted thereon said telescopic assembly and wherein said support further comprises means for extending and retracting said free end of said telescopic assembly into and out of said access lock and means for



rotating said telescopic assembly to a first target handling position and a second target handling position such that in said first target handling position said telescopic assembly is operationally checked by actuating said means for extending and retracting said free end of said telescopic assembly into and out of said access lock and in said second target handling position said axis of said telescopic assembly is aligned with said axis of said access lock and said means for extending and retracting said free end of said telescopic assembly into and out of said access lock is actuated to extend said free end of said telescopic assembly into said access lock.

4,464,332

DEVICE FOR CONTROLLING THE DIMENSIONS AND SPACED APART RELATIONSHIP OF RIGID PIECES DISPOSED IN A BUNDLE

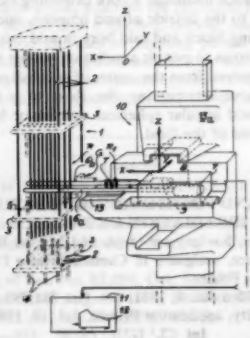
Lucien Boisseuil, Fontenay-Aux-Roses; Pierre Luciani, Villiers Le Bacle, and René Merard, Igny, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 16, 1981, Ser. No. 322,011

Claims priority, application France, Nov. 26, 1980, 80 25067

Int. Cl.³ G21C 7/36

U.S. Cl. 376—215 **22 Claims**



1. Device for controlling the dimensions and spaced-apart relationship of rigid pieces disposed in a bundle of rows, said device comprising at least one pair of probes consisting of a first probe able to emit a light beam and of a second probe able to pick up said light beam, said probes being intended for surrounding a piece to be controlled, and for each of these pairs;

means for displacing the probes transversely to the piece to be controlled;

a photodetector to receive the light beam picked up by the second probe and to produce an electrical signal; and

electronic means for processing this signal, furnishing information for controlling the dimensions of the piece due to the modulation of said signal, provoked by the occultation of the light beam by said piece, said occultation being obtained by the displacement of the probes transversely to this piece,

wherein each probe comprises a light conduit which is supple and insertable between rows of pieces to be controlled, said electronic means then making it possible to also control the spaced-apart relationship of the pieces.

4,464,333

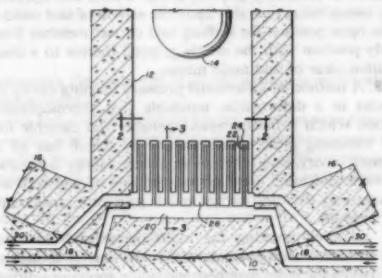
MOLTEN CORE RETENTION AND SOLIDIFICATION APPARATUS

William D. Wohlsen, East Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 5, 1982, Ser. No. 354,979

Int. Cl.³ G21C 9/00

U.S. Cl. 376—280 **4 Claims**



1. In a nuclear reactor having a containment shell housing a nuclear reactor vessel with a reactor core in said reactor vessel, a fluid cooled heat exchanger molten core retention and solidification apparatus for confining molten material in the event of a meltdown of said reactor core and said nuclear reactor vessel while removing heat from the molten material to a location external to the containment shell, comprising:

a. an open-top confinement shell disposed within the containment shell directly beneath the reactor vessel, the confinement shell defining a cavity for collecting molten material from the reactor vessel in the event of a core meltdown;

b. a plurality of vertically extending heat exchange tube assemblies disposed within the confinement shell beneath the reactor vessel, each tube assembly including a neutron absorbing material and comprising a vertically extending outer tube being closed at its upper end and open at its lower end and a vertically extending inner tube disposed substantially concentrically within and spaced from the outer tube so as to define a flow passageway through the interior of the inner tube and the annular space between the outside of the inner tube and the inside of the outer tube, the inner tube being open at both its upper and lower ends;

c. a protective material covering the exterior surface of the outer tube of each tube assembly, the protective material conducting heat from the molten material to the underlying outer tube, said protective material having a melting temperature sufficiently above the temperature of the molten material such that the protective material can

withstand the temperature of the molten material without melting;

d. a plurality of orifices, one in the flow passageway of each tube assembly, to control fluid flow through each flow passageway, wherein the size of said orifice varies depending upon the location of said orifice in the heat exchanger apparatus;

e. an inlet plenum disposed beneath the plurality of tube assemblies, the inlet plenum connected in fluid communication with one of the tubes of each tube assembly;

f. an outlet plenum disposed beneath the plurality of tube assemblies, the outlet plenum connected in fluid communication with the other of the tubes of each tube assembly; and

g. means for circulating a heat exchange fluid into the inlet plenum, thence from the inlet plenum through the flow passageways defined within the tube assemblies into and through the outlet plenum to a location external to the containment shell, the heat exchange fluid flowing through the tube assemblies being passed in heat exchange relationship with any molten material from a core meltdown collecting in the confinement cavity so as to absorb heat therefrom and remove said heat to a location external to the containment shell.

4,464,334

FAST NEUTRON NUCLEAR REACTORS

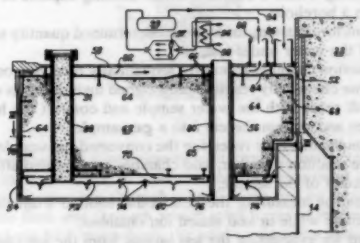
Robert Artaud, Aix-en-Provence; Michel Aubert, Manosque; Guy Lemercier, Le Puy Sainte; Paul Lambert, Echirolles, and Gilbert Chevallier, Saint Ismier, all of France, assignors to Commissariat a l'Energie Atomique, France

Filed Nov. 30, 1981, Ser. No. 325,762

Claims priority, application France, Dec. 9, 1980, 80 26082

Int. Cl.³ G21C *11/08*

U.S. Cl. 376—298 **11 Claims**



1. In a nuclear reactor cooled by a liquid metal contained in a main vessel with a vertical axis and topped by an atmosphere of neutral gas, said vessel being obturated by horizontal upper closing means comprising a slab and at least one rotating plug, said upper closing means comprising at least one circuit for circulation of a cooling fluid placed inside said closing means, the cooling fluid being a gas, said circuit comprising a plurality of compartments defined by substantially radial vertical partitions, the gas passing, inside each compartment, through the thickness of said closing means from top to bottom, to penetrate in a supply manifold defined between substantially the complete lower face of said closing means corresponding to said compartment and a first substantially horizontal wall located thereabove, the gas then passing, inside each compartment, through the thickness of said closing means again, from bottom to top, to penetrate in an evacuation manifold defined between substantially the complete upper face of the closing means corresponding to said compartment and a second substantially horizontal wall located therebeneath, so as to cool said closing means to a quasi-homogeneous temperature and to maintain the surfaces dipped by the atmosphere of neutral gas at a temperature greater than 100° C., at nominal running of the reactor.

4,464,335

NICKEL/IRON CASTING ALLOY EXHIBITING HIGH STRENGTH AT ELEVATED TEMPERATURES AND HIGH MICROSTRUCTURAL STABILITY

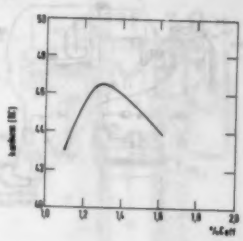
Helmut Brandis, Forstwaldstr. 694, 4150 Krefeld; Wolfgang Spyra, Bloemersheimstr. 12,, 4150 Krefeld, and Josef Reismann, Köln-Berlinerstr. 94, 4600 Dortmund, all of Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,456

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1982, 3207162

Int. Cl.³ C22C *28/00*

U.S. Cl. 420—584 **9 Claims**



1. Nickel/iron casting alloy, containing no cobalt, exhibiting high strength at elevated temperatures accompanied by insensitivity to thermal fatigue, possessing microstructural constituents which are thermodynamically highly stable, and exhibiting, in addition, high hardness at elevated temperatures, outstanding resistance to oxidation, corrosion and wear, as well as good welding properties, composed of

1.1 to 1.6% of carbon
0.5 to 1.5% of silicon
0.01 to 0.2% of manganese
22 to 26% of chromium
12.5 to 14.5% of molybdenum
0.2 to 0.8% of niobium (columbium)
35 to 40% of nickel
less than 0.01% of boron
less than 0.002% of tantalum and
18 to 26% of iron, to make up 100%.

4,464,336

METHOD OF STERILIZATION

Tatsumi Hiramoto, Himeji, Japan, assignor to Ushio Denki Kabushikikaisha, Tokyo, Japan

Continuation of Ser. No. 261,270, May 6, 1981, abandoned. This application Nov. 29, 1982, Ser. No. 445,042

Claims priority, application Japan, May 15, 1980, 55-63421

Int. Cl.³ A61L *2/10*

U.S. Cl. 422—24 **7 Claims**

1. A method of ultraviolet light sterilization comprising the steps of: (a) emitting short high intensity ultraviolet rays having a frequency of 3,000 Å or less from a flash discharge lamp containing a rare gas as a luminous component, wherein the energy density of the luminescence from the flash discharge lamp is 0.03 (J/cm^2 msec) or more and (b) applying the emitted short high intensity ultraviolet rays to microorganisms to be destroyed by the sterilizing effect of the ultraviolet rays.

4,464,337

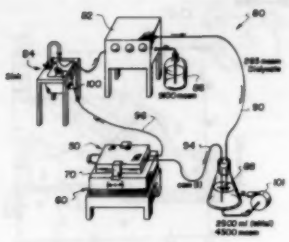
DIALYSIS PROCESSING OF PRESERVED LIVING CELLS AND CELL COMPONENTS

Allen Zelman, Troy, N.Y., assignor to Rensselaer Polytechnic Institute, Troy, N.Y.

Continuation of Ser. No. 231,804, Feb. 5, 1981, abandoned, which is a continuation-in-part of Ser. No. 119,423, Feb. 7, 1980, Pat. No. 4,306,556. This application Jun. 27, 1983, Ser. No. 508,017

Int. Cl.³ B01J *19/00*; A01N *1/00*; B01D *13/00*

U.S. Cl. 422—41 **8 Claims**



1. A method of preserving a specimen of blood or blood components containing water and living cells comprising:

providing a sealed bag, for containing one unit of the specimen, made of semi-permeable membrane which is permeable to a preservative and has at least one port for entry of the specimen

collecting the specimen in the sealed bag of semi-permeable membrane through the port;

sealing the port so that the bag can be handled and stored as a portable unit of the specimen;

supplying a dialysate, including glycerine as the preservative, over the bag to draw water out of the bag through the permeable membrane, whereby the specimen is dehydrated and preserved by glycerolization;

the preservative containing highly dehydrated, deoxygenated glycerol with anti-oxidant whereby the cells are dehydrated, deoxygenated and ready for storage in the bag; and

storing the bag with the contained specimen and preservative as a unit of the specimen.

3. A method of adding a preservative of a biological specimen comprising:

providing a sealed bag having a semi-permeable wall which is permeable to the preservative and has at least one port for entry of the specimen;

supplying the specimen to the bag through the port;

sealing the port so that the bag with the contained specimen is transportable for storage and handling as a unit of the specimen;

positioning the bag with its contained specimen in a transport cell;

supplying a dialysate which includes the preservative, over an outer surface of the bag wall in the cell, the dialysate having an initial osmoality similar to the osmoality of the contents of the bag to cause preservative to enter the bag through the semi-permeable wall;

agitating the specimen in the bag to reduce a boundary layer adjacent its wall;

increasing the osmoality of the dialysate supplied over the bag surface to control the flow of preservative in the bag as the concentration of preservative in the bag increases;

removing the bag from the transport cell with its contained specimen to which preservative has been added; and

storing the bag as a unit of the specimen.

4,464,338

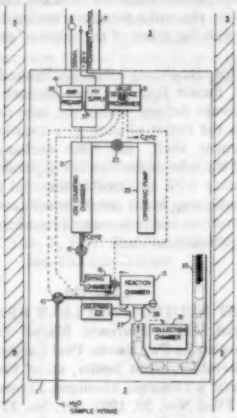
IN SITU TRITIUM BOREHOLE PROBE FOR MEASUREMENT OF TRITIUM

Danny W. Dotson, Sterling Park, Va.; Jon L. Mikesell, Greenbelt, and Frank E. Senftle, Chevy Chase, both of Md., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 24, 1980, Ser. No. 200,110

Int. Cl.³ G01N *31/00*

U.S. Cl. 422—78 **3 Claims**



1. A system for determining the in situ activity of tritium in water by measuring the beta particles emitted by the tritium, comprising within a common sonde housing capable of being used in a borehole:

means for obtaining an in situ predetermined quantity sample of the water under test;

a reaction chamber means for sequentially receiving one at a time chemically reactive preweighed material units which will react with the water sample and convert the hydrogen and tritium therein into a gas sample;

an ion chamber for receiving the converted gas sample from the reaction chamber, said chamber being sealed after the receipt of the sample;

means for measuring the beta count emitted from the gas sample while in said sealed ion chamber;

means for evacuating the gas sample from the ion chamber after the count has been completed and allowing the introduction of a new gas sample thereinto;

means for supplying the preweighed material units to the reaction chamber to mix with a different in situ water sample; and

a collection chamber to receive the residue from the material units after reacting with the water.

4,464,339

GAS SENSOR ELEMENTS AND METHODS OF MANUFACTURING THEM

Gordon S. Wilkinson-Tough, Gledhow, England, assignor to International Gas Detectors Limited, England

Division of Ser. No. 221,272, Dec. 30, 1980, Pat. No. 4,416,911. This application Jul. 22, 1983, Ser. No. 516,095

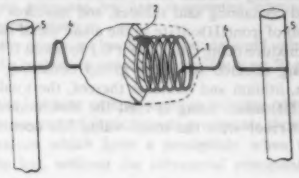
Claims priority, application United Kingdom, Jan. 2, 1980, 8000040

Int. Cl.³ G01N *27/16*

U.S. Cl. 422—94 **5 Claims**

1. A gas sensor element comprising an electrical resistance filament; and a bead surrounding said electrical resistance filament; said bead including alumina particles and particles of a catalyst for inducing catalytic oxidation of flammable gases,

said alumina particles being interspersed between and bound together only by said particles of catalyst to form an open



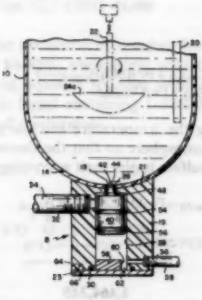
porous gas diffusive skeletal matrix, said matrix having a mean particle size of less than 20 nm.

4,464,340

DISSOLUTION FLASK

John C. Lennox, Jr.; Warren A. McAllister, both of Greenville, and Donald L. Mason, Washington, all of N.C., assignors to Burroughs Wellcome Co., Triangle Park, N.C.

Filed Jun. 15, 1981, Ser. No. 273,317
Int. Cl.³ B01L *11/02*
U.S. Cl. 422—103 **6 Claims**



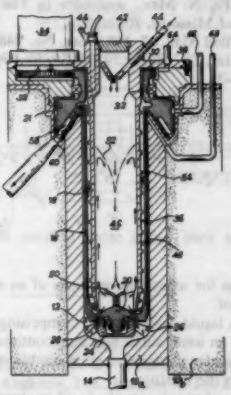
1. A system for dissolution of solid forms of matter to determine their solubility in a solvent media, comprising a flask having an open top through which media can be introduced into the flask and through which solid forms of matter to be treated can be deposited into the solid media and a hemispherical bottom containing a bottom opening concentric with the vertical axis of the flask through which residual solute can be withdrawn and means for controlling withdrawal of the residual solute from the bottom of the flask through said bottom opening comprising a valve body secured to the bottom of the flask over the bottom opening defining an elongate valve chamber, the axis of which coincides with the vertical axis of the flask and is centered with respect to the center of the bottom opening, a piston valve reciprocally mounted in the valve chamber, a valve element at one end of the piston valve corresponding in cross section to the bottom opening, said piston valve being movable in the chamber to on the one hand project the valve element into the bottom opening to close the same and on the other hand to withdraw the valve element from the bottom opening to permit flow through the bottom opening into the valve chamber, a discharge port in the valve body adjacent the upper end in a position to be covered by the piston valve when the valve element occupies the bottom opening and to be uncovered by retraction of the piston valve, a discharge pump connected to the discharge port, a control port at the lower end of the chamber, a selector valve connected to the control port, and a vacuum pump and a pressure pump connected to the selector valve operable by movement of the selector valve alternately to connect the vacuum pump and the pressure pump to the chamber to effect reciprocation of the piston valve.

4,464,341

VORTEX APPARATUS FOR THE CONTINUOUS PRODUCING OF A PRECIPITATE

Pierre Auchapt, Cité des Cyprès, and Aimé Ferlay, Laudun, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 29, 1982, Ser. No. 403,021
Claims priority, application France, Aug. 12, 1981, 81 15603
Int. Cl.³ B01F *9/20*; B01J *8/10, 8/14*
U.S. Cl. 422—202 **8 Claims**



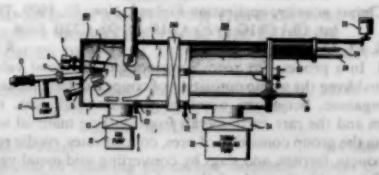
1. A vortex apparatus for the continuous production of a precipitate by reacting together at least two reactants, which comprises a rotary bowl having a vertical axis, means for rotating the rotary bowl, a fixed cylinder arranged coaxially within the bowl, said fixed cylinder being positioned with the bottom thereof spaced from the bottom surface of said rotary bowl, thereby defining an annular raising chamber and providing a fluid-flow connection between said raising chamber and a reaction chamber defined within the fixed cylinder, reactant inlet pipes issuing into the upper part of the reaction chamber in the vicinity of the axis of the bowl, at least one weir fixed to the rotary bowl at the upper end of the raising chamber and a turbine fixed to the rotary bowl in the lower part of the reaction chamber, so as to produce a vortex in said reaction chamber and ensure the raising of part of the precipitate into the raising chamber.

4,464,342

MOLECULAR BEAM EPITAXY APPARATUS FOR HANDLING PHOSPHORUS

Won-Tien Tsang, New Providence, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 14, 1982, Ser. No. 378,281
Int. Cl.³ C30B *35/00*
U.S. Cl. 422—247 **6 Claims**



1. A molecular beam epitaxy apparatus comprising an evacu-

able first chamber having a plurality of effusion ovens, an evacuable second chamber, said second chamber being an outgassing chamber, a valve connecting said first and said second chambers, a pump for removing material from said second chamber, and a cryo-panel, said cryo-panel being capable of being moved between said first chamber and said second chamber through said valve; for moving said cryo-panel between said first chamber and said second chamber; means for heating said cryo-panel in said second chamber.

4,464,343

PROCESS FOR ISOTOPE SEPARATION

William S. Hitchcock, St. James, Mo., and Joseph F. Stampfer, Jr., Santa Fe, N. Mex., assignors to The Curators of the University of Missouri, Rolla, Mo.

Filed Mar. 27, 1981, Ser. No. 248,295
Int. Cl.³ B01D *59/00, 59/50, 59/02*
U.S. Cl. 423—3 **21 Claims**

1. A process for separating isotopes of an element comprising the steps of:

preparing a liquid feed mixture comprising an aqueous solvent and an ionic surfactant and containing two isotopes of a particular element in an ionizable compound that is present in the mixture;

passing a gas through a pool of said mixture to form bubbles therein, the surfaces of said bubbles having said surfactant thereon and one isotope of said element preferentially adsorbed thereto as a result of a chemical exchange between said surfactant and another component of said mixture, so that the concentration ratio of said isotopes at said bubble surfaces differs from that in the bulk of said pool, producing at the upper surface of said pool a top fraction comprising a foam that is enriched in said one isotope as compared to the bulk of said pool;

moving said foam vertically through a column above said upper surface and permitting the bubble size thereof to increase, thereby effecting drainage of liquid from said foam to provide an internal reflux and rectification within said column; and

collapsing said foam to form an overhead liquid fraction relatively enriched in said one isotope.

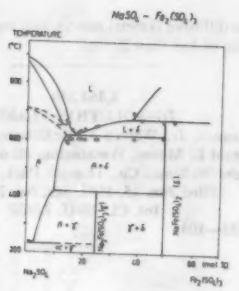
4,464,344

PROCESS FOR RECOVERING NON-FERROUS METAL VALUES FROM ORES, CONCENTRATES, OXIDIC ROASTING PRODUCTS OR SLAGS

Pekka J. Saikkonen, Alakartanontie 4 B 63, 02360 Espoo 36, Finland

PCT No. PCT/FI80/00008, 371 Date Jun. 29, 1981, 102(e) Date Jun. 29, 1981, PCT Pub. No. WO81/01420, PCT Pub. Date May 28, 1981
PCT Filed Nov. 20, 1980, Ser. No. 278,584
Claims priority, application Finland, Nov. 22, 1979, 791684
Int. Cl.³ C01G *1/10;* **C01F** *15/00;* **C22B** *1/06*
U.S. Cl. 423—5 **8 Claims**

1. In a process for recovering nonferrous metal values selected from the group consisting of copper, cobalt, nickel, zinc, manganese, beryllium, uranium, thorium, cadmium, magnesium and the rare earth metals from starting material selected from the group consisting of ores, concentrates, oxidic roasting products, ferrites, and slags by converting said metal values to sulfates with the aid of thermal treatment under oxidizing conditions in the temperature range of 400°–800° C., the improvement which comprises (a) forming a reaction mixture of said starting material containing at least one of said metal values, iron(III)sulfate and another sulfate selected from the group consisting of alkali metal sulfate, ammonium sulfate, a compound containing said sulfates, and mixtures thereof, the molar ratio of iron(III)sulfate to the alkali metal sulfate in said reaction mixture being from about 0.1 to about 0.5, said alkali metal being selected from the group consisting of sodium, potassium, lithium and mixtures thereof, the total amount of said iron(III)sulfate being at least the stoichiometric amount needed to react with the metal value Me according to the reaction:



$$3MeO_{(melt+solid)} + Fe_2(SO_4)_{3(melt)} \rightarrow 3MeSO_{4(melt)} + Fe_2O_{3(solid)}$$

and (b) adjusting the temperature and the partial pressure of SO_3 in the gas atmosphere so that the thermal decomposition of said iron(III)sulfate in the melt according to the reaction

$$Fe_2(SO_4)_{3(melt)} \rightarrow Fe_2O_{3(solid)} + 3SO_{3(gas)}$$

is substantially prevented.

4,464,345

METHOD OF PRECIPITATING CONTAMINANTS IN A URANIUM LEACHATE USING FERRI IONS, COMPLEXING AGENT, AND PH CONTROL

Tsoung-Yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 22, 1982, Ser. No. 452,164
Int. Cl.³ C01G *43/00, 39/00;* **C01B** *33/113*
U.S. Cl. 423—7 **22 Claims**

1. A method for the recovery of uranium from a carbonate lixiviant which containes uranium and molybdenum values, wherein the carbonate lixiviant is characterized by having a pH of at least 4 and a carbonate concentration of at least 50 ppm by weight, comprising the steps of:

(a) treating the lixiviant with an aqueous solution containing a sufficient amount of ferric ion to precipitate the molybdenum values without substantial precipitation of uranium values;

(b) separating the precipitate from the lixiviant; and

(c) passing the treated lixiviant through ion-exchange resin to cause the resin to retain uranium values.

21. A process for the in situ leaching of uranium values from a subterranean uranium-bearing formation, wherein the formation additionally contains other mineral values, comprising the steps of:

(a) penetrating the formation by at least one injection well and at least one production well in communication with the injection well;

(b) introducing into the formation an aqueous leaching solution containing an oxidant and a uranium complexing agent selected from the group consisting of carbonates,

bicarbonates, carbon dioxide dissolved in water or any combination thereof;

(c) allowing the leaching solution to traverse the formation to solubilize the uranium values therein;

(d) producing pregnant leachate containing uranium and other mineral values;

(e) treating the produced leachate to obtain a pH value of at least 5 and a carbonate concentration of at least 50 ppm by weight;

(f) treating the leachate with an aqueous solution containing a sufficient amount of ferric iron to precipitate those other mineral values which form a precipitate when treated with ferric ion, without the substantial precipitation of uranium values;

(g) separating the precipitate from the leachate; and

(h) passing the treated leachate over an ion exchange resin to cause the resin to retain uranium values.

4,464,346

EXTRACTION OF URANIUM WITH TRIPHOSPHONIC ESTERS

Georges Sturtz, Brest; Thierry Pensec, Bannalec, and Jean-Claude Gautier, Billere, all of France, assignors to Societe Nationale Elf Aquitaine (Production), France

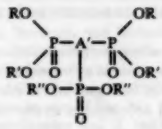
Filed Jul. 7, 1980, Ser. No. 166,291

Claims priority, application France, Jul. 9, 1979, 79 17737

Int. Cl.³ C01G *43/00*

U.S. Cl. 423—10 **8 Claims**

1. A process for the extraction of uranium from an aqueous solution containing 10-45% phosphoric acid thereof which comprises mixing said aqueous solution with a composition comprising an organic liquid containing 1-30% by weight of a triphosphonic ester of the formula



in which A′ is a trivalent hydrocarbon grouping having 1 to 6 carbon atoms, R is a C_1 to C_4 alkyl or a hydrogen atom, R′ is a C_1 to C_4 alkyl, a hydrogen atom or alkali metal or ammonium cation, and R″ is a C_4 to C_{18} alkyl.

4,464,347

RECOVERY OF ALUMINUM FROM SPENT LIQUOR

J. Finley Bush, New Kensington, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 27, 1982, Ser. No. 453,353

Int. Cl.³ C01F *7/06*; C01D *1/34*

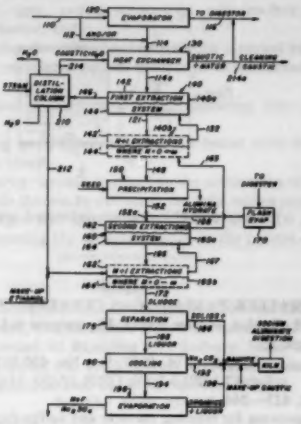
U.S. Cl. 423—112 **7 Claims**

1. An improved process for the recovery of alumina from ore containing aluminum compounds which previously has been subject to a Bayer type caustic digest wherein sulfate and fluoride impurities in the ore normally digested with the alumina and recycled back to the digestor in the spent liquor may be selectively removed comprising:

(a) contacting spent liquor from an alumina precipitation stage with ethyl alcohol to separate the mixture into a first layer comprising the ethyl alcohol and at least a portion of the caustic from the spent liquor and a second layer which comprises the remainder of the spent liquor;

(b) subjecting said second layer to a second precipitation to remove further alumina values;

(c) treating at least a portion of the spent liquor from said second precipitation to remove said sulfate and fluoride impurities said treating including contacting said portion of spent liquor from said second precipitation with ethyl alcohol; and



(d) recycling said purified spent liquor back to said ore digestion.

4,464,348

SELECTIVE EXTRACTION OF COBALT FROM ORES

John L. Burba, III, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jan. 10, 1983, Ser. No. 456,655

Int. Cl.³ C22B *23/04*

U.S. Cl. 423—150 **30 Claims**

1. A process for extracting cobalt values from a cobalt-containing solid material comprising ores, minerals, slags, or gangues which contain reducible cobalt in the +3 state, said cobalt-containing material also containing nickel values, said process consisting essentially of the sequential steps of

contacting the cobalt-containing material, in particulate form, with an aqueous solution containing a reducing agent of at least one from the group comprising hydrazine, hydroxylamine, hydrazine hydrosulfate, sodium pyrosulfate, and alkali metal persulfate, which substantially reduces cobalt values but which reduces little or no nickel values,

thereby obtaining reduced cobalt values in solution, with little or no nickel values in the solution,

separating said solution, containing reduced cobalt values, from the nickel-containing insolubles,

and

recovering cobalt values, substantially free of nickel values, from the solution.

4,464,349

METHOD AND APPARATUS FOR THE REMOVAL OF CARBON MONOXIDE FROM THE EXHAUST DISCHARGES OF SMALL INTERNAL COMBUSTION ENGINES

John H. Onley, 6809 Robinia Rd., Temple Hills, Md. 20748

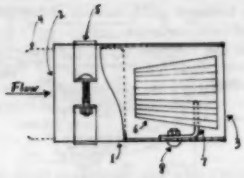
Filed Aug. 17, 1982, Ser. No. 408,787

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—213.2 **1 Claim**

1. A method of reducing the carbon monoxide content of garden and lawn equipment powered by small internal com-

bustion engines which consists of contacting said exhaust gases, prior to discharge thereof to the surrounding atmo-



sphere, with cuprous chloride amalgamated with tricalcium silicate.

4,464,350

PARALLEL PASSAGE GAS TREATING PROCESS

Milton L. Kaplan, Morton Grove, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 16, 1982, Ser. No. 450,302

Int. Cl.³ B01J *8/00*; C01B *17/00, 21/00*

U.S. Cl. 423—244 **10 Claims**

1. A process for treating particle and sulfur dioxide containing gas streams which comprises the steps of:

(a) passing the gas stream through planar passages located between porous walls of adjacent solids-filled gas treatment packages filled with a sulfur dioxide acceptor at treatment-promoting conditions which include a gas velocity sufficient to maintain turbulent flow; and to remove sulfur dioxide from the gas the stream,

(b) creating additional turbulence within the passages by passing the gas stream across turbulence-inducing means comprising elongated members located within the passages at locations between the porous walls and aligned parallel to the porous walls.

4,464,351

PROCESS FOR THE THERMAL DESTRUCTION OF SOLID METABLE HALOGENATED WASTE WITH RESULTANT PRODUCTION OF HYDROGEN HALIDE THEREFROM

Vladimir Vasak, St. Ives; Joze Sencar, Caringbah, and King K. Mok, Concord West, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

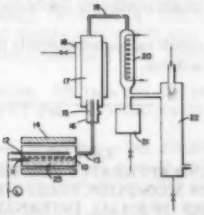
PCT No. PCT/AU81/00186, 371 Date Jun. 22, 1982, 102(e) Date Jun. 22, 1982, PCT Pub. No. WO82/02001, PCT Pub. Date Jun. 24, 1982

PCT Filed Dec. 7, 1981, Ser. No. 394,916

Claims priority, application Australia, Dec. 8, 1980, PE6817

Int. Cl.³ C01B *7/00, 7/03*

U.S. Cl. 423—486 **15 Claims**



1. A process of thermal destruction of solid meltable heavy halogenated waste characterized in that a pre-heated mixture of heavy halogenated waste vapour and a carrier gas comprising at least 80% v/v hydrogen is burnt in a hydrogen/oxygen flame wherein the gaseous oxygen fed to the flame has an oxygen content of at least 40% w/w, and wherein the pre-heated mixture is formed by heating the heavy halogenated waste until molten and passing it concurrently with a quantity of carrier gas containing sufficient hydrogen for complete conversion of the heavy halogenated waste to hydrogen halide into a vaporization chamber maintained at or above 300° C.

4,464,352

MANUFACTURE OF ACICULAR FERRIMAGNETIC IRON OXIDE

Horst Autzen, Freinsheim; Herbert Motz, Beindersheim; Peter Rudolf, Neuhofen; Wilhelm Sarnecki, Limburgerhof; Werner Steck, Mutterstadt, and Guenter Vaeth, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 006,530, Jan. 25, 1979. This application Dec. 10, 1982, Ser. No. 448,489

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1978, 2805405

Int. Cl.³ C01G *49/06*

U.S. Cl. 423—634 **1 Claim**

1. A process for the manufacture of acicular ferrimagnetic iron oxide, which comprises:

(a) dehydrating needle-shaped synthetic lepidocrocite particles having a mean particle length of from 0.2 to 1.5 μm, a length to width ratio of at least 10:1 and a particle surface area of from 18 to 70 m^2g, which lepidocrocite exhibits substantially no dendritic branching by heating in air or in an inert gas atmosphere and at a temperature in the range of 300° to 700° C.;

(b) reducing the resulting particles to acicular magnetite particles by heating the same at a temperature in the range of 300° to 650° C., under an inert gas, and in contact with an organic compound which decomposes at the reducing temperature; and

(c) oxidizing the resulting magnetite particles at a temperature in the range of 150° to 500° C. and in the presence of air to convert said magnetite particles into acicular ferrimagnetic gamma-ferric oxide particles.

4,464,353

QUICKLIME SLAKING PROCESS

Norman L. Hains, Houston, Tex., assignor to Chemlime Corporation, N.J.

Continuation of Ser. No. 390,397, Jun. 21, 1982, abandoned. This application Nov. 9, 1983, Ser. No. 550,501

Int. Cl.³ C01F *11/02*

U.S. Cl. 423—640 **5 Claims**

1. In the method for hydrating calcium oxide with an aqueous slaking medium to form a lime slurry, the improvement comprising the step of adding a soluble sulfate compound to the slaking medium prior to contacting the calcium oxide with the slaking medium, and then contacting the calcium oxide with the slaking medium to directly form a flowable and pumpable lime slurry having a solids content greater than 32% by weight.

4,464,354

(3,4-C)-PYRIDO PSORALENS, PROCESS OF PREPARATION, APPLICATION IN COSMETOLOGY AND THERAPEUTICS, AND COSMETOLOGICAL AND PHARMACEUTICAL COMPOSITION WITH THEM

Emile Bisagni, Orsay; Louis Dubertret, Paris; Jacqueline Moroa, Gif sur Yvette; Dietrich Averbeck, L'Hay les Roses; Dora Papadopoulo, Buc; Jocelyne Blais, Fontenay aux Roses; Paul Vigny, Paris; Maria N. Schwencke, Gif sur Yvette; Ethel Moustacchi, Palaiseau; Silvano Nocentini, Paris, and Francois Zajdela, Antony, all of France, assignors to Institut National de la Sante et de la Recherche Medicale, Paris, France

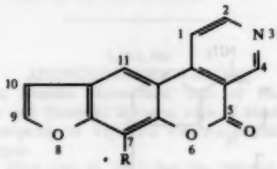
Filed Feb. 24, 1983, Ser. No. 469,455

Claims priority, application France, Feb. 25, 1982, 82 03157

Int. Cl.[3] C07D *491/22;* A61K *31/44*

U.S. Cl. 424—59 16 Claims

1. Pyrido (3,4-c)-psoralens or pyrido (3,4-c) furo (3,2-g) coumarins having the following formula:



wherein R is selected from the group consisting of a hydrogen atom, and a lower alkyl group having from 1 to 4 carbon atoms.

4,464,355

SERUM-FREE AND MITOGEN-FREE T-CELL GROWTH FACTOR AND PROCESS FOR MAKING SAME

Hans-Ake Fabricius, Breisach, and Roland Stahn, Holzhauser, both of Fed. Rep. of Germany, assignors to Hooper Trading Co., Curacao, Netherlands Antilles

Division of Ser. No. 247,769, Mar. 26, 1981, Pat. No. 4,390,623, which is a continuation-in-part of Ser. No. 193,112, Oct. 2, 1980, abandoned. This application Sep. 3, 1982, Ser. No. 414,808

Int. Cl.[3] A61K *35/14*

U.S. Cl. 424—101 4 Claims

1. A serum-free and mitogen-free T-cell growth factor derived from human, bovine or porcine peripheral mononuclear blood cells.

2. The serum-free and mitogen-free T-cell growth factor as defined in claim 1 which is produced by the process comprising

(1) separating peripheral mononuclear blood cells from a human, bovine or porcine donor;

(2) washing the cells several times with a liquid tissue culture medium;

(3) separating the washed cells from the tissue culture medium;

(4) stimulating the cells obtained in step (3) by incubating the cells in a tissue culture medium supplemented with serum and mitogen;

(5) separating the stimulated cells from the medium;

(6) washing the stimulated cells with fresh tissue culture medium several times to remove substantially all of the serum and mitogen;

(7) suspending the cells obtained in step (6) in another portion of fresh tissue culture medium;

(8) conditioning the cells in the suspension of step (7) by incubating cells so as to transfer the growth factor into the liquid; and

(9) separating the conditioned cells from the solution to obtain a supernatant containing the growth factor.

3. A method of activating the production of natural killer cells of patients suffering from tumors comprising:

(1) isolating peripheral mononuclear blood cells from the patient's blood,

(2) mixing the cells obtained in step (1) in a tissue culture medium, agar, and a serum-free, mitogen-free, T-cell growth factor; and

(3) incubating the mixture of step (2) for a period of 7 days to form colonies of natural killer cells on the surface of the agar.

4. A method of treating a patient suffering from tumors comprising:

(1) isolating peripheral mononuclear blood cells from the patient's blood;

(2) stimulating the cells to improve the production of natural killer cells therein by culturing the cells with a serum-free and mitogen-free T-cell growth factor; and

(3) administering the stimulated cells to the patient.

4,464,356

ANOREXIGENIC COMPOSITION AND METHOD

John P. Mordes, 80 Devonshire Rd., Waban, Mass. 02168, and Aldo A. Rossini, 62 Rambling Rd., Sudbury, Mass. 01776

Continuation of Ser. No. 375,877, May 7, 1982, abandoned. This application Jun. 21, 1983, Ser. No. 497,630

Int. Cl.[3] A61K *35/407*

U.S. Cl. 424—106 8 Claims

1. Method for reducing appetite in a mammal comprising administering an appetite suppressing dose of an aqueous extract of a 5123 Morris Hepatoma.

4,464,357

TREATMENT OF EPILEPSY WITH BISULFITE

Jose A. Arias-Alvarez, Carpatos, Mexico, assignor to T&R Chemicals, Inc., Clint, Tex.

Filed May 26, 1983, Ser. No. 498,488

Int. Cl.[3] A61K *33/04*

U.S. Cl. 424—162 5 Claims

1. A method of treating epilepsy and epileptic conditions in a person suffering from the symptoms of epilepsy comprising orally administering to said person a symptom-alleviating amount of a compound selected from the group consisting of alkali metal sulfites and alkali metal bisulfites at an effective rate of from about 0.2 to about 50 mg. thereof per kilogram of body weight per 24 hours.

4,464,358

HOMOCYCLIC DERIVATIVES

Michael T. Cox, Congleton, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Aug. 30, 1982, Ser. No. 412,905

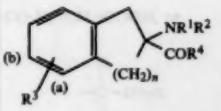
Claims priority, application United Kingdom, Sep. 15, 1980, 8127869

Int. Cl.[3] A61K *37/00;* C07C *103/52, 121/50, 101/44;* A01N *43/02, 37/10*

U.S. Cl. 424—177 5 Claims

1. A homocyclic derivative of the formula:

V



wherein:

R^1 stands for alkyl, alkenyl, chloroalkenyl or alkynyl, each of not more than 4 carbon atoms, or cyclopropylmethyl or cyclobutylmethyl;

R^2 stands for alkyl, alkenyl, chloroalkenyl or alkynyl, each of not more than 4 carbon atoms, or cyclopropylmethyl, cyclobutylmethyl or 2-furylmethyl;

R^3 is a substituent at ring position (a) or (b), and it stands for

hydroxy, or methoxy or alkanoyloxy of not more than 5 carbon atoms;

R^4 stands for methoxy, ethoxy, cyanomethoxy, allyloxy, —Phe—OCH_3, —Gly—Gly—Phe—Leu—OH or Gly—Gly—Phe—Met—OH; and n stands for 2; or a pharmaceutically-acceptable salt thereof.

4,464,359

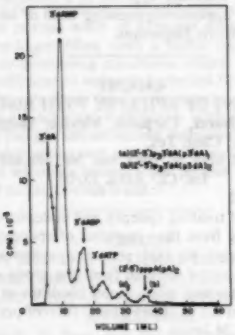
(2'-5')-OLIGO (3'-DEOXYADENYLATE) AND DERIVATIVES THEREOF

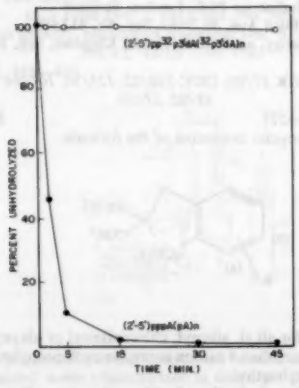
Robert J. Suhadolnik, Roslyn, Pa.; Joseph M. Wu, Mohegan Lake, N.Y.; Paul Doetsch, Beltsville, Md., and Earl E. Henderson, Elkins Park, Pa., assignors to Research Corporation, New York, N.Y.

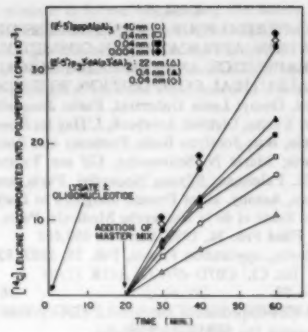
Filed Apr. 10, 1981, Ser. No. 252,926

Int. Cl.³ A61K *31/70*; **C07H** *15/12, 17/00*

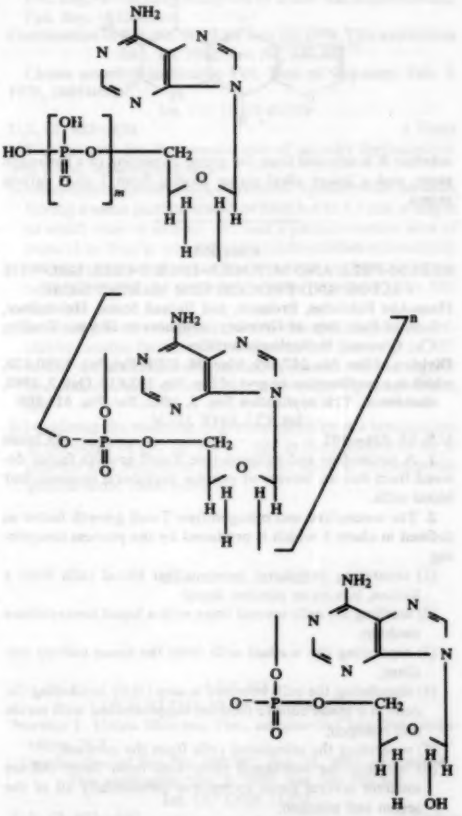
U.S. Cl. 424—180 **11 Claims**







1. The oligomer of the formula:



wherein m is 0,1,2 or 3 and n is 0,1,2,3 or 4.

6. An anti-viral composition which comprises an anti-Epstein Barr virus effective amount of a compound of claim 1 and a pharmaceutically acceptable carrier.

10. A method of inhibiting transformation of Epstein Barr virus which comprises administering to a subject infected with said virus an inhibitorily effective amount of a compound of claim 1.

4,464,360

GLYCOSPHINGALIPIDS FOR INHIBITING BACTERIAL ADHERENCE

Hakon Leffler, Änggårdsgatan 47, and Catharina Svanborg Edén, Stora Gårda 29, both of Göteborg, Sweden

PCT No. PCT/SE81/00138, 371 Date Dec. 23, 1981, 102(e) Date Dec. 23, 1981, PCT Pub. No. WO81/03175, PCT Pub. Date Nov. 12, 1981

PCT Filed May 8, 1981, Ser. No. 336,345

Claims priority, application Swe[illegible], May 9, 1980, 8003491; Jan. 23, 1981, 8100401; Jan. 23, 1981, 8100402

Int. Cl.[3] A61K *31/73*

U.S. Cl. 424—180 2 Claims

1. A method of treating mammals suffering from infection due to bacteria adhering to the epithelial cells of the urinary tract comprising administering an amount of at least one of an active compound selected from the group consisting of globotetraosylceramide, globotriaoxylceramide and globotetraos effective to treat the bacterial infection.

4,464,361

ADENOSINE DERIVATIVES

Sadao Ohki; Fumiko Hamaguchi, both of Tokyo; Tatsuo Nagasaka, and Hiroyuki Kikuchi, both of Hachiohji, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

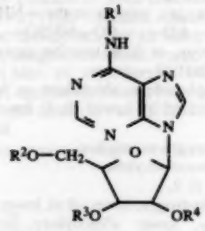
Filed Apr. 14, 1982, Ser. No. 368,416

Claims priority, application Japan, Apr. 15, 1981, 56-57466

Int. Cl.[3] A61K *31/70*; C07H *19/06*

U.S. Cl. 424—180 4 Claims

1. An adenosine derivative of the general formula:



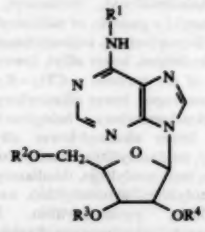
wherein

R^1 is 2,5-dioxo-3-pyrrolidinyl, and

R^2, R^3 and R^4 are each hydrogen or lower alkanoyl,

and pharmaceutically acceptable salts thereof.

4. An anti-hypertension pharmaceutical composition containing an anti-hypertensive effective amount of one or more adenosine derivatives of the general formula:



wherein

R^1 is 2,5-dioxo-3-pyrrolidinyl, and

R^2, R^3 and R^4 are each hydrogen or lower alkanoyl,

and pharmaceutically acceptable salts thereof, in admixture with pharmaceutically acceptable carriers.

4,464,362

TOPICAL SKIN REPAIR COMPOSITION

Martin Kludas, and Dieter Heise, both of Berlin, Fed. Rep. of Germany, assignors to Estee Lauder Inc., New York, N.Y.

PCT No. PCT/EP81/00086, 371 Date Feb. 23, 1982, 102(e) Date Feb. 23, 1982, PCT Pub. No. WO82/00093, PCT Pub. Date Jan. 21, 1982

PCT Filed Jun. 26, 1981, Ser. No. 355,579

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024318

Int. Cl.[3] A61K *35/74*

U.S. Cl. 424—195 20 Claims

1. Cosmetic compositions for topical application to a person's skin for promoting the repair of DNA in skin cells damaged by exposure to ultraviolet radiation, comprising a vehicle for topical application and a DNA repair capacity effective amount of an active substance complex which promotes the DNA repair process in skin cells, the active substance complex including inactivated cultures of bacteria selected from a genus of the group consisting of Bifidobacterium, Actinomycetaceae, Propionibacteriaceae, Lactobacillaceae and Coryneform bacteria.

4,464,363

AJUVANTS FOR RECTAL DELIVERY OF DRUG SUBSTANCES

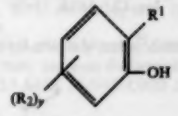
Takeru Higuchi; Toshiaki Nishihata, and Howard J. Rytting, all of Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 213,121, Dec. 5, 1980, abandoned, which is a continuation-in-part of Ser. No. 105,645, Dec. 20, 1979, abandoned. This application Jun. 25, 1981, Ser. No. 277,291

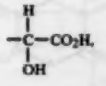
Int. Cl.[3] A61K *31/625*

U.S. Cl. 424—232 15 Claims

1. A method for enhancing the rate of absorption of a rectally administered drug from a rectal compartment into the blood stream, said method comprising the steps of preparing a drug form capable of being rectally administered, said drug form comprising a therapeutically effective dosage amount of a drug selected from the group consisting of insulin, pentagastrin and gastrin capable of being absorbed into the blood stream from the rectal compartment and an adjuvant of the formula:



wherein R_1 is CO_2H, $(CH_2)COOH$, or



or a pharmaceutically acceptable salt thereof wherein R_2 is OH, H, a lower alkoxy radical, a lower alkyl radical, a halo radical, or a tri-halo lower alkyl radical, and

wherein y is an integer of 1 or 2, said adjuvant being present in said drug form in a sufficient amount to be effective in enhancing said absorption rate, and administering said drug form into said rectal compartment.

4,464,364

6β,7β-METHYLENE-17α-PREGN-4-ENE-21,17-CARBOLACTONES, THEIR PREPARATION AND USE AS MEDICINAL AGENTS

Dieter Bittler; Henry Laurent; Rudolf Weichert, all of Berlin; Jorge Casals-Stenzel, Mainz, and Ekkehard Schillinger, Berlin, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Fed. Rep. of Germany

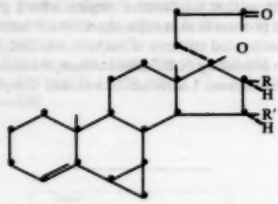
Filed Jun. 9, 1983, Ser. No. 502,848

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1982, 3222265

Int. Cl.³ A61K *31/33*

U.S. Cl. 424—241 10 Claims

1. A 6β,7β-methylene-17α-pregn-4-ene-21,17-carbolactone of the formula



wherein

R and R' each is hydrogen or together form a methylene group.

8. A method of achieving a diuretic effect in a patient in need of such treatment comprising administering to the patient an amount of a compound of claim 1 effective as a diuretic.

4,464,365

11β-CHLORO-Δ[15]-STEROIDS, A PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL PREPARATIONS CONTAINING THEM

Helmut Hofmeister; Karl Petzoldt; Klaus Annen; Henry Laurent; Rudolf Wiechert, and Yukeshige Nishino, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Fed. Rep. of Germany

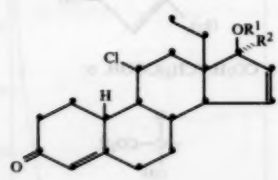
Filed Apr. 18, 1983, Ser. No. 485,800

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1982, 3214690

Int. Cl.³ A61K *31/56*

U.S. Cl. 424—243 19 Claims

1. An 11β-chloro-Δ[15]-steroid of the formula



wherein

R^1 is hydrogen or an acyl group derived from a C_{1-15}-hydrocarbon carboxylic acid, and

R^2 is ethynyl, chloroethynyl, or propynyl.

16. A pharmaceutical composition comprising a progestationally effective amount of an 11β-chloro-Δ[15]-compound of claim 1 and a pharmacologically acceptable carrier.

4,464,366

CEPHEM COMPOUNDS HAVING A TERMINAL AMINOCARBOXYLIC ACID GROUPING AND CONTAINING AN AZACYCLYL(THIO)UREIDO GROUP

Hansuli Wehrli, Reinach; Karoly Kocsis, Olsberg, and Riccardo Scartazzini, Basel, all of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

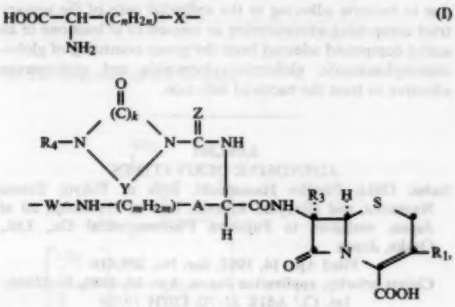
Filed Dec. 8, 1980, Ser. No. 214,155

Claims priority, application Switzerland, Dec. 19, 1979, 11283/79

Int. Cl.³ C07D *501/36*; A61K *31/545*

U.S. Cl. 424—246 18 Claims

1. Compounds of the formula



(I)

in which

n represents an integer from 1 to 4,

m represents 0 or 1,

X represents oxygen, sulphur or the —NH—group,

W represents —CO—, —CO—$NHSO_2$— or the —SO_2N-H—CO—group, or X-W together represent —CO— or the —CO—$NHSO_2$—group,

A represents phenylene, thienylene or furylene, or such group substituted by lower alkyl, lower alkoxy and/or halogen,

Z represents oxygen or sulphur,

Y represents lower alkylene,

k represents 1 or 2,

R_4 represents hydrogen, lower alkyl, lower alkyl substituted by hydroxy, lower alkanoyloxy, lower alkoxycarbonyloxy, lower alkoxy, lower alkylthio, halogen, amino, di-lower alkylamino, lower alkenyl, lower alkanoyl, lower alkanoyl substituted by halogen, lower alkoxy, lower alkanoyloxy, cyano, benzoyl, benzoyl substituted by lower alkyl, hydroxy, lower alkoxy or chlorine, a pyridinecarboxylic, pyrimidinecarboxylic or pyrazinecarboxylic acid radical, a pyridinecarboxylic, pyrimidinecarboxylic or pyrazinecarboxylic acid radical substituted by hydroxy or chlorine, lower alkoxycarbonyl, benzenesulfonyl, naphthalenesulfonyl, carbamoyl, thiocarbamoyl, iminocarbamoyl (=guanyl), or sulfamoyl, or lower alkylcarbamoyl, thiocarbamoyl, iminocarbamoyl or sulfamoyl,

R_1 represents hydrogen, lower alkyl, lower alkoxy, halogen or a group of the formula —CH_2—R_2 in which R_2 is hydroxy or mercapto, lower alkanoyloxy, carbamoyloxy, lower alkylcarbamoyloxy, halogeno-lower alkylcarbamoyloxy, lower alkanoyl-lower alkylcarbamoyloxy, lower alkoxy, imidazolylthio, triazolylthio, tetrazolylthio, thiazolylthio, isothiazolylthio, thiadiazolylthio, thiatriazolylthio, oxazolylthio, isoxazolylthio, oxadiazolylthio, 1-oxidopyridylthio, pyridazinylthio, N-oxidopyridazinylthio, 2-oxo-1,2-dihydropyrimidinylthio, or 5,6-dioxotetrahydro-as-triazinylthio or imidazolylthio, triazolylthio, tetrazolylthio, thiazolylthio, isothiazolylthio, thiadiazolylthio, thiatriazolylthio, oxazolylthio, isoxazolylthio, oxadiazolylthio, 1-oxidopyridylthio, pyridazinylthio, N-oxidopyridazinylthio, 2-oxo-1,2-dihy-

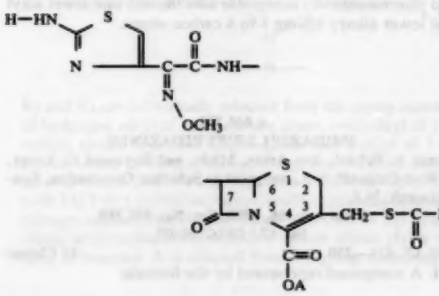
dropyrimidinylthio, or 5,6-dioxotetrahydro-as-triazinylthio substituted by lower alkyl, hydroxy-lower alkyl, lower alkanoyloxy-lower alkyl, halogeno-lower alkyl, carboxy-lower alkyl, lower alkoxycarbonyl-lower alkyl, sulpho-lower alkyl, amidated sulpho-lower alkyl, amino-lower alkyl, mono- or di-lower alkylamino lower alkyl, lower alkanoylamino lower alkyl, halogen, amino, mono- or di-lower alkylamino, lower alkanoylamino, nitro, hydroxy, lower alkoxy, carboxy, lower alkoxycarbonyl, carbamoyl, N-mono- or N,N-di-lower alkyl carbamoyl, cyano, oxo or by oxido, or R_2 is tri-lower alkylammonium, pyrimidinium, pyridazinium, thiazolium, quinolinium or pyridinium or pyrimidinium, pyridazinium, thiazolium, quinolinium, or pyridinium mono- or disubstituted by lower alkyl, hydroxy-lower alkyl, amino, 4-aminophenylsulfonamido, hydroxy, halogen, halogen-lower alkyl, carboxyl, lower-alkoxycarbonyl, cyano, carbamoyl, lower alkylcarbamoyl, di-lower alkylcarbamoyl, hydrazinocarbonyl, lower alkyl-hydrazinocarbonyl, carboxy-lower alkyl, lower alkanoyl, or 1-lower alkylpyrrolidinyl, and R_3 represents hydrogen, and wherein the term lower indicates the group thus defined is having one to four carbon atoms, and wherein the carboxyl groups are in the free form or are present as lower alkanoyloxymethoxycarbonyl, amino-lower alkanoylmethoxycarbonyl, phthalidyloxycarbonyl or indanyloxycarbonyl that can be split under physiological conditions, and pharmaceutically acceptable salts of such compounds.

4,464,367
CEPHALOSPORIN DERIVATIVES, PROCESS FOR PREPARATION THEREOF AND DRUGS CONTAINING SAID DERIVATIVES USABLE AS ANTIBIOTICS

Bernard Labeeuw, Montpellier, and Ali Salhi, St. Gely Du Fesc, both of France, assignors to Sanofi, Paris, France

Filed Mar. 19, 1981, Ser. No. 245,328
Claims priority, application France, Mar. 26, 1980, 80 06757
Int. Cl.³ A61K *31/545*; C07D *501/56*
U.S. Cl. 424—246 **12 Claims**

1. A compound corresponding to the formula



(I)

wherein:
the group

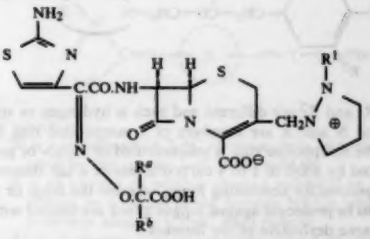
in the 4 position is a pharmaceutically acceptable radical selected from the group consisting of acid radicals, alkali salts, alkaline earth salts, amine salts and easily hydrolyzable or metabolically labile ester radicals, and
R_3 is a radical selected from the group consisting of 2-furyl radicals and 2-thienyl radicals.

4,464,368
CEPHALOSPORIN ANTIBIOTICS

Cynthia H. O'Callaghan, Gerrards Cross; Barry E. Ayres, Ickenham; Christopher E. Newall, London; David G. H. Livermore, Princes Risborough, and Derek R. Sutherland, Chalfont St. Giles, all of England, assignors to Glaxo Group Limited, London, England

Continuation of Ser. No. 172,952, Jul. 28, 1980, abandoned, which is a continuation of Ser. No. 94,087, Nov. 14, 1979, abandoned. This application Jul. 23, 1981, Ser. No. 285,966
Claims priority, application United Kingdom, Nov. 15, 1978, 44595/78; Nov. 15, 1978, 44597/78
Int. Cl.³ C07D *501/38*; A61K *31/425*
U.S. Cl. 424—246 **10 Claims**

1. A cephalosporin antibiotic selected from the group consisting of compounds of the formula:



(I)

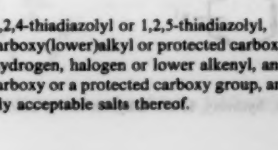
wherein
R^1 and R^b, which may be the same or different, each represents a C_{1-4} alkyl group, or together with the carbon atom to which they are attached form a C_{3-7} cycloalkylidene group and
R^1 represents a C_{1-4} alkyl group and non-toxic salts thereof.

4,464,369
7-ACYLAMINO-3-CEPHEM-4-CARBOXYLIC ACID DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS

Takao Takaya, Kawanishi; Hisashi Takasugi, Osaka; Kiyoshi Tsuji, and Toshiyuki Chiba, both of Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 886,340, Mar. 14, 1978, Pat. No. 4,425,341, and a continuation-in-part of Ser. No. 302,613, Sep. 15, 1981, Pat. No. 4,399,133, which is a division of Ser. No. 886,340,. This application Mar. 8, 1982, Ser. No. 355,339
Claims priority, application United Kingdom, Mar. 14, 1977, 10699/77; Jul. 12, 1977, 29245/77; Oct. 11, 1977, 42315/77; Jan. 3, 1978, 75/78
The portion of the term of this patent subsequent to Aug. 16, 2000, has been disclaimed.
Int. Cl.³ A61K *31/545*; C07D *501/22*
U.S. Cl. 424—246 **19 Claims**

1. A compound of the formula:



(I)

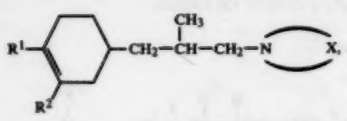
in which
R^1 is 1,2,4-thiadiazolyl or 1,2,5-thiadiazolyl,
R^2 is carboxy(lower)alkyl or protected carboxy(lower)alkyl,
R^3 is hydrogen, halogen or lower alkenyl, and
R^4 is carboxy or a protected carboxy group, and pharmaceutically acceptable salts thereof.

4,464,370
CYCLOHEXENE CONTAINING MORPHOLINES AND FUNGICIDAL USE

Walter Gramlich, Edingen; Walter Himmele, Walldorf; Christoph Martin, Mannheim; Ernst-Heinrich Pommer, Limburgerhof, and Hardo Siegel, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 20, 1982, Ser. No. 380,470
Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121349
Int. Cl.³ A01N *43/84*; C07D *295/02*
U.S. Cl. 424—248.4 4 Claims

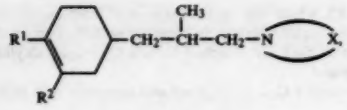
1. A cyclohexene derivative of the formula



I

where R^1 and R^2 are different and each is hydrogen or tert.-butyl and N and X are members of a morpholine ring and where the morpholine ring is unsubstituted or mono- or poly-substituted by alkyl of 1 to 4 carbon atoms or a salt thereof.

2. A process for combating fungi, wherein the fungi or the objects to be protected against fungus attack are treated with a cyclohexene derivative of the formula



I

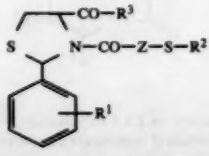
where R^1 and R^2 are different and each is hydrogen or tert.-butyl and N and X are members of a morpholine ring and where the morpholine ring is unsubstituted or mono- or poly-substituted by alkyl of 1 to 4 carbon atoms or a salt thereof.

4,464,371
FIVE-MEMBERED HETEROCYCLIC COMPOUNDS

Jun-ichi Iwao, Takarazuka; Tadashi Iso, Sakai, and Masayuki Oya, Ibaraki, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

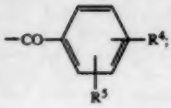
PCT No. PCT/JP81/00401, 371 Date Jul. 27, 1982, 102(e) Date Jul. 27, 1982, PCT Pub. No. WO82/02200, PCT Pub. Date Jul. 8, 1982
PCT Filed Dec. 22, 1981, Ser. No. 406,241
Claims priority, application Japan, Dec. 29, 1980, 56-67
Int. Cl.³ C07D *277/30, 417/12*; A61K *31/425, 31/50*
U.S. Cl. 424—250 17 Claims

1. A compound of the general formula [I],

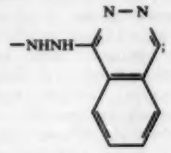


[I]

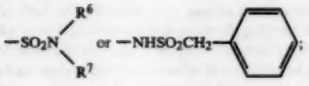
wherein
R^1 is hydrogen, hydroxy, lower alkyl or lower alkoxy;



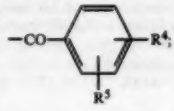
R^2 is hydrogen, benzoyl or



R^3 is hydroxy, lower alkoxy, NHOH or



R^4 is



R^5 is hydrogen or halogen;
R^6 is hydrogen or lower alkyl; R^7 is lower alkyl; and
Z is straight or branched lower alkylene containing 1 to 3 carbon atoms;

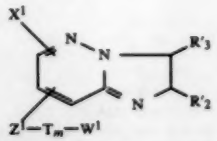
when R^3 is hydroxy or lower alkoxy, R^2 is
and pharmaceutically acceptable salts thereof, said lower alkyl and lower alkoxy having 1 to 6 carbon atoms.

4,464,372
IMIDAZO[1,2-B]PYRIDAZINES

James A. Bristol, Ann Arbor, Mich., and Raymond G. Lovey, West Caldwell, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Aug. 16, 1982, Ser. No. 408,358
Int. Cl.³ C01G *56/00*
U.S. Cl. 424—250 15 Claims

1. A compound represented by the formula:



I'

and pharmaceutically acceptable salts thereof, wherein R'_2 and R'_3 independently represent methyl, cyanomethyl or amino; X' represents hydrogen or methyl; and $Z'—T'_m—W'$ represents phenylmethoxy, phenylmethanamino, phenylethyl, 2-phenylethenyl or 3-phenyl-1-propenyl.

4,464,373

4,5-DIHYDROIMIDAZO-[1,2-a]QUINOXALINE-2-CARBOXYLIC ACIDS AND THEIR DERIVATIVES WITH ANTIALLERGIC ACTIVITY

Alan C. Barnes, Cirencester; David P. Kay, Purton; Peter D. Kennewell; Frederick L. Parker, both of Swindon, and David A. Rowlands, Malmesbury, all of England, assignors to Roussel Uclaf, Paris, France

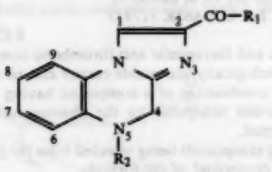
Filed Apr. 22, 1983, Ser. No. 487,617

Claims priority, application United Kingdom, Apr. 28, 1982, 8212325

Int. Cl.³ A61K *31/495*; C07D *487/04*

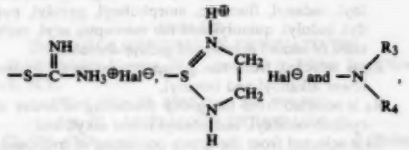
U.S. Cl. 424—250 20 Claims

1. A compound selected from the group consisting of imidazoquinoxalines of the formula

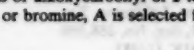


I

wherein R_1 is selected from the group consisting of hydroxy, alkoxy of 1 to 5 carbon atoms and cyclohexylcarbonyloxymethoxy, R_2 is selected from the group consisting of alkoxycarbonylvinyl of 4 to 7 carbon atoms, —COR, —CONH$(CH_2)_n$—X and —A—$(CH_2)_m$—Y, R is selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms, cycloalkyl of 3 to 10 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkoxy of 1 to 5 carbon atoms, alkoxycarbonyl of 2 to 5 carbon atoms, amino, $—CF_3$, $—CHCl_2$, phenyl, aralkyl of 7 to 10 carbon atoms, aralkoxy of 7 to 10 carbon atoms, n is 0 and X is phenyl or n is an integer from 1 to 5 and X is selected from the group consisting of



R_3 and R_4 are individually selected from the group consisting of hydrogen, alkyl of 1 to 5 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, aryl of 6 carbon atoms and aralkyl of 7 to 8 carbon atoms or R_3 and R_4 taken together with the nitrogen atom to which they are attached form a saturated heterocycle with 4 to 8 ring carbon atoms optionally containing at least one nitrogen atom optionally substituted with alkyl of 1 to 3 carbon atoms or alkoxycarbonyl of 2 to 5 carbon atoms, Hal is chlorine, or bromine, A is selected from the group consisting of



m is an integer from 1 to 3, Y is

their non-toxic, pharmaceutically acceptable acid addition salts when R_1 is other than —OH and their salts with pharmaceutically acceptable metals or nitrogen bases when R_1 is OH.

4,464,374

SUBSTITUTED GUANIDINE DERIVATIVES, PROCESSES, PHARMACEUTICAL COMPOSITIONS AND METHODS AND INTERMEDIATES

Tobias O. Yellin, Fremont, Calif.; David J. Gilman, Tytherington, England; Derrick F. Jones, Tytherington, England, and Keith Oldham, Cheadle, England, assignors to ICI Americas Inc., Wilmington, Del. and Imperial Chemical Industries PLC, London, England

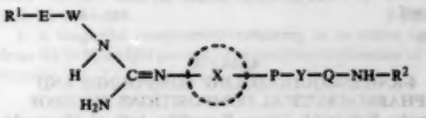
Filed Jul. 23, 1981, Ser. No. 286,064

Claims priority, application United Kingdom, Jul. 30, 1980, 8024963

Int. Cl.³ C07D *277/38, 239/42*; A61K *31/425, 31/505*

U.S. Cl. 424—251 8 Claims

1. A guanidine derivative of the formula:



I

in which

W is a straight chain 2–6C alkylene chain optionally substituted by one or two 1–4C alkyl radicals;

E is an oxygen or sulphur atom, a sulphinyl or sulphonyl radical, or a radical of the formula NR^3 in which R^3 is a hydrogen atom or a 1–6C alkyl radical;

R^1 is a hydrogen atom or a straight-chain 1–6C alkyl radical optionally substituted by one or two 1–4C alkyl radicals; or R^1 and R^3 are alkyl and are joined to form, together with the nitrogen atoms to which they are attached, a morpholine, pyrrolidine, piperidine or piperazine ring;

ring X is a phenyl ring carrying 1 or 2 optional substituents or a 5- or 6-membered heterocyclic aromatic ring selected from the group consisting of a thiophene, pyridine, pyrimidine, imidazole, thiazole, oxazole, pyrazole, triazole, thiadiazole, oxadiazole, pyrazine, pyridazine, isothiazole, isoxazole or triazine ring, which heterocyclic ring may, where possible, carry a single optional substituent, the optional substituents on ring X being selected from fluorine, chlorine, bromine and iodine atoms and 1–6C alkyl, 1–6C alkoxy, 1–6C alkylthio, trifluoromethyl, hydroxy and amino radicals;

Y is an oxygen or sulphur atom, a direct bond, a methylene, cis or trans vinylene or sulphinyl radical or a radical of the formula NR^4 in which R^4 is a hydrogen atom or a 1–6C alkyl radical;

P is a direct bond or a 1–4C unbranched alkylene radical optionally substituted by one or two 1–4C alkyl radicals;

Q is a 1–4C unbranched alkylene radical optionally substituted by one or two 1–4C alkyl radicals, provided that when Y is an oxygen atom, a sulphinyl radical or a radical of the formula NR^4, Q is a 2–4C optionally substituted alkylene radical;

R^2 is a radical of the formula —A—B in which A is a 3,4-dioxocyclobuten-1,2-diyl radical or a radical of the formula C=Z in which Z is a sulphur or oxygen atom or a radical of the formula NCN, NNO_2, $CHNO_2$, $NCONH_2$, $C(CN)_2$, $NCOR^5$, NSO_2R^5, NCO_2R^5 or NR^6 in which R^5 is a 1–6C alkyl, 1–6C haloalkyl, 7–10C alkylaryl or 6–10C aryl radical or a pyridyl radical and R^6 is a hydrogen atom or a 1–6C alkyl, 1–6C haloalkyl, 7–10C alkylaryl or 6–10C aryl radical or —A— is a radical of the formula:

II

in which p is 1 or 2 and B is a 1–6C alkyl, 1–6C alkoxy or

1–6C alkylthio radical or a radical of the formula NR^7R^8 in which R^7 and R^8, which may be the same or different, are hydrogen atoms or 1–6C alkyl, 1–6C haloalkyl, 2–6C alkoxycarbonyl, 3–6C alkenyl, 3–6C alkynyl (in which the double or triple bond respectively is separated from the nitrogen atom or NR^7R^8 by at least one carbon atoms), 2–6C (primary hydroxy)alkyl, 2–6C (primary amino)alkyl, 3–8C alkylaminoalkyl, 4–8C dialkylaminoalkyl (in the latter two of which the nitrogen atom is separated from the nitrogen atom of NR^7R^8 by at least two carbon atoms), 6–10C aryl or 3–8C cycloalkyl radicals, or R^7 and R^8 are alkyl and are joined to form, together with the nitrogen atom to which they are attached, a 5- or 6-membered saturated ring which optionally contains an oxygen atom or an NR^9 radical in which R^9 is a hydrogen atom or a 1–6C alkyl radical;

and the pharmaceutically-acceptable acid-addition salts thereof.

4,464,375

4-ANILINOQUINAZOLINE COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS THEREOF

Shinsaku Kobayashi; Katsuo Kamoshita, both of Hiromachi; Shigeki Nagai, Ube; Takeo Honda, Ube; Kiroku Oda, Ube; Katsutoshi Fujii, Ube; Takashi Kobayashi, Ube, and Mikio Kojima, Ube, all of Japan, assignors to Sankyo Co., Ltd., Tokyo and Ube Industries Ltd., Ube, both of, Japan

Division of Ser. No. 74,343, Sep. 11, 1979, Pat. No. 4,322,420. This application Aug. 3, 1981, Ser. No. 289,379

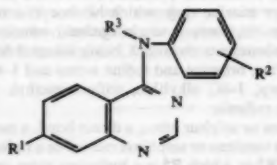
Claims priority, application Japan, Sep. 11, 1978, 53-111484

The portion of the term of this patent subsequent to Mar. 30, 1999, has been disclaimed.

Int. Cl.³ A61K *31/505*; **C07D** *239/94*

U.S. Cl. 424—251 **18 Claims**

14. A pharmaceutical composition comprising a pharmaceutically acceptable carrier or diluent and an analgesic and anti-inflammatory effective amount of at least one compound of formula (I):



(I)

in which:

R^1 represents a halogen atom, or a trifluoromethyl group;

R^2 represents a hydrogen atom, a C_1–C_4 alkyl group, an alkoxy group having a C_1–C_4 alkyl moiety or a halogen atom; and

R^3 represents a hydrogen atom or a C_1–C_4 alkyl group; and pharmacologically acceptable acid addition salts thereof.

4,464,376

ANALGESIC AND ANTI-INFLAMMATORY COMPOSITIONS COMPRISING CAFFEINE AND METHODS OF USING SAME

Abraham Sunshine, New York; Eugene M. Laska, Larchmont, and Carole E. Siegel, Mamaroneck, all of N.Y., assignors to Richardson-Vicks, Inc., Wilton, Conn.

Continuation of Ser. No. 400,597, Jul. 22, 1982, abandoned. This application Oct. 11, 1983, Ser. No. 541,010

Int. Cl.³ A61K *31/19, 31/22, 31/44, 31/46, 31/52, 31/135, 31/485*

U.S. Cl. 424—253 **25 Claims**

1. A pharmaceutical composition of matter for use in eliciting an onset hastened and enhanced analgesic response in a mammal, said composition comprising:

(a) an analgesically effective amount of a non-steroidal anti-inflammatory drug selected from naproxen, fenoprofen, indoprofen or diflunisal or the pharmaceutically acceptable salts thereof; and

(b) an amount of caffeine sufficient to hasten the onset of and enhance the analgesic response.

4,464,377

ANTI-THROMBOTIC THERAPEUTIC COMPOSITIONS

Jean Blanchard, and Edouard Panak, both of 73 Ave. Raymond Naves, 31500 Toulouse, France

Continuation of Ser. No. 108,652, Dec. 31, 1979, abandoned, which is a continuation-in-part of Ser. No. 917,374, Jun. 20, 1978, Pat. No. 4,210,649. This application Aug. 12, 1981, Ser. No. 292,241

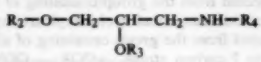
Claims priority, application France, Jun. 22, 1977, 77 19161; United Kingdom, Dec. 29, 1978, 50360/78

Int. Cl.³ A61K *31/435*

U.S. Cl. 424—256 **6 Claims**

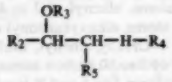
1. A prophylactic and therapeutic anti-thrombotic composition comprising a biologically acceptable carrier and an effective amount of the combination of a compound having beta-blocking properties and ticlopidine or the pharmaceutically acceptable salts thereof,

said beta-blocking compounds being selected from the group consisting of a compound of the formula:



(II)

and



(III)

in which:

R_2 is selected from the group consisting of phenyl, naphthyl, indanyl, fluorene, morpholinyl, pyridyl, pyrimidyl, indolyl, quinolyl and the mercapto, acyl, carboxy, nitro or amino substituted groups thereof,

R_3 is selected from the group consisting of hydrogen, lower alkanoyl and benzoyl,

R_4 is selected from the group consisting of lower alkyl, cycloloweralkyl, and phenyl lower alkyl, and

R_5 is selected from the group consisting of hydrogen and lower alkyl; and the pharmaceutically acceptable salts thereof.

4,464,378

METHOD OF ADMINISTERING NARCOTIC ANTAGONISTS AND ANALGESICS AND NOVEL DOSAGE FORMS CONTAINING SAME

Anwar A. Hussain, Lexington, Ky., assignor to University of Kentucky Research Foundation, Lexington, Ky.

Filed Apr. 28, 1981, Ser. No. 258,308

Int. Cl.³ A61K *31/485*

U.S. Cl. 424—260 **51 Claims**

1. A method for eliciting an analgesic or narcotic antagonist response in a warm-blooded animal, which comprises nasally administering to said animal:

(a) to elicit an analgesic response, an analgesically effective amount of morphine, hydromorphone, metopon, oxymorphone, desomorphine, dihydromorphine, levorphanol, cyclazocine, phenazocine, levallorphan, 3-hydroxy-N-methylmorphinan, levophenacylmorphan, metazocine, norlevorphanol, phenomorphan, nalorphine, nalbuphine, buprenorphine, butorphanol or pentazocine, or a nontoxic pharmaceutically acceptable acid addition salt thereof; or

(b) to elicit a narcotic antagonist response, a narcotic antagonist effective amount of naloxone, naltrexone, diprenor-

phine, nalmexone, cyprenorphine, levallorphan, alazocine, oxilorphan, cyclorphan, nalorphine, nalbuphine, buprenorphine, butorphanol, cyclazocine or pentazocine, or a nontoxic pharmaceutically acceptable acid addition salt thereof.

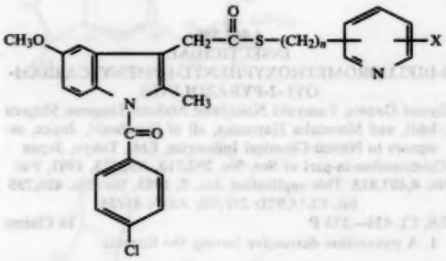
4,464,379

INDOL ACETIC ACID DERIVATIVES AND ANTI-INFLAMATORY AND RELATED USES THEREOF

Hans Betzing, Kerpen-Horrem, and Sigurd Leyck, Brauweiler, both of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

Filed Jun. 1, 1981, Ser. No. 269,515
Int. Cl.³ C07D *401/12;* A61K *31/44*
U.S. Cl. 424—263 **12 Claims**

1. Indol acetic acid derivative having the general formula I



I

wherein

X is H, F, Cl or a C_{1-3}-alkyl group

n is an integer from 0 to 3,

and the pharmacologically acceptable salts thereof.

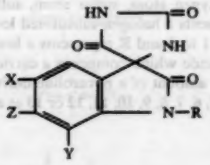
4,464,380

IMIDAZOLIDINEDIONE DERIVATIVES

Alan J. Hutchison, Verona, N.J., assignor to Pfizer Inc., New York, N.Y.

Filed May 25, 1983, Ser. No. 497,962
Int. Cl.³ A61K *31/435;* C07D *401/14*
U.S. Cl. 424—263 **7 Claims**

1. A compound of the formula;



and the pharmaceutically acceptable salts thereof, wherein

X and Y are each hydrogen, fluorine, chlorine, bromine, nitro or amino;

Z is hydrogen or amino, with the proviso that Z is always other than amino when at least one of X and Y is other than hydrogen;

R is a member selected from the group consisting pyridyl and pyridyl-lower alkyl wherein the pyridyl groups may be unsubstituted or substituted by a group selected from fluorine, chlorine, bromine and alkyl having from one to four carbon atoms.

7. A method for treating a diabetic host to prevent or alleviate chronic complications arising in said host, which comprises administering to said diabetic host an effective amount of a compound as claimed in claim 1.

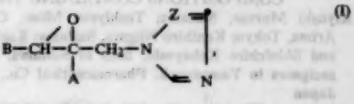
4,464,381

FUNGICIDES CONTAINING AZOLYLMETHYLOXIRANES

Bernd Janssen, Ludwigshafen; Norbert Meyer, Ladenburg; Ernst-Heinrich Pommer, Limburgerhof, and Eberhard Ammermann, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 5, 1983, Ser. No. 491,650
Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218130
Int. Cl.³ A01N *43/48, 43/50*
U.S. Cl. 424—269 **3 Claims**

1. A fungicidal composition containing as an active agent from 0.1 to 95 weight percent of an azolylmethyloxirane of the formula



(I)

where A and B are identical or different and independently of one another are each alkyl of 1 to 4 carbon atoms, naphthyl, biphenyl or phenyl, and the phenyl radical can be substituted by halogen or nitro, or by alkyl, alkoxy or haloalkyl, each of 1 to 4 carbon atoms, or by phenoxy or phenylsulfonyl, and Z is CH or N, or a plant-tolerated addition salt or metal complex thereof, and a solid or liquid inert additive.

4,464,382

RHODANINE DERIVATIVES, PROCESS FOR THEIR PREPARATION, AND ALDOSE REDUCTASE INHIBITOR CONTAINING THE RHODANINE DERIVATIVES AS ACTIVE INGREDIENT

Tadao Tanouchi, Takatsuki; Masanori Kawamura, Ibaraki; Akio Ajima, Osaka; Tetsuya Mohri, Takatsuki; Masaki Hayashi, Takatsuki; Hiroshi Terashima, Takatsuki; Fumio Hirata, Suita, and Takeshi Morimura, Otsu, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Filed Aug. 12, 1981, Ser. No. 292,076
Claims priority, application Japan, Aug. 22, 1980, 55-115641
Int. Cl.³ C07D *277/36;* A61K *31/425*
U.S. Cl. 424—270 **5 Claims**

1. An aldose reductase inhibitor containing, as an active ingredient, 3-carboxymethyl-5-(2-methylcinnamylidene)rhodanine or non-toxic salts of an acid thereof.

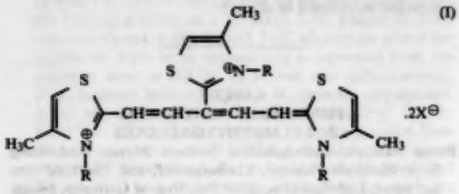
4,464,383

IMMUNOMODULATOR CONTAINING TRITHIAZOLE PENTAMETHINE CYANINE DERIVATIVE

Itaru Yamamoto, No. 1-102, Kikyo-machi, Hanajiri, Okayama-shi, Okayama-ken, Japan

Filed Aug. 3, 1982, Ser. No. 404,843
Claims priority, application Japan, Nov. 24, 1981, 56-188610; Jun. 14, 1982, 57-102393
Int. Cl.³ A61U *31/425*
U.S. Cl. 424—270 **9 Claims**

1. A method of treating an immune disease comprising administering an immunomodulating effective amount of a trithiazole pentamethine cyanine derivative of the general formula (I)



wherein R is an alkyl group having 1 to 15 carbon atoms, and X is a halogen atom, or a residual group of perchloric acid, nitric acid or an organic acid, to a patient having an immune disease.

4,464,384

2-PHENYLIMIDAZO[2,1-b]BENZOTHIAZOLE COMPOUNDS, SALTS THEREOF, PROCESS OF PRODUCING THEM, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Kiyoshi Murase, Saitama; Toshiyasu Mase, Chiba; Hideki Arima, Tokyo; Kunihiro Niigata, Saitama; Kenichi Tomioka, and Shinichiro Kobayashi, both of Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1982, Ser. No. 449,759

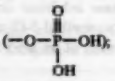
Claims priority, application Japan, Dec. 23, 1981, 56-208609; Oct. 27, 1982, 57-188866

Int. Cl.³ C07D *513/04;* A61K *31/425*

U.S. Cl. 424—270 **9 Claims**

1. A 2-phenylimidazo(2,1-b)benzothiazole compound represented by general formula I:

wherein R_1 represents a group shown by the formula $-O-A-B)_nD$ (wherein A represents a carbonyl group or a sulfonyl group; B represents a saturated or unsaturated lower alkylene group which may be substituted by a carboxy group, an amino group, or a lower alkoxy group and may be interrupted by an oxygen atom; n represents 0 or 1; and D represents a carboxy group, a lower alkoxycarbonyl group, an amino group, or a mono- or di-lower alkylamino group) or a phosphoric acid residue



and R_2 represents a hydrogen atom or a carboxyacetoxy group, with the proviso that R_1 is a hydrogen atom when R_2 is a carboxyacetoxy group; and R_3 represents a hydrogen atom, a halogen atom, or a lower alkoxy group and the salts thereof.

4,464,385

TREATMENT OF DIABETIC COMPLICATIONS WITH HYDANTOINS

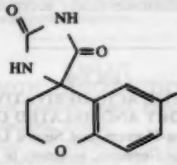
Billie M. York, Jr., Fort Worth, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Apr. 15, 1982, Ser. No. 368,629

Int. Cl.³ A61K *31/415;* C07D *491/107*

U.S. Cl. 424—273 R **4 Claims**

3. A method for treatment of mammals suffering from diabetic complications comprising orally administering an effective amount of spiro-chroman-imidazolidine having the formula



or a pharmaceutically acceptable salt thereof where R=CH_3S— and $CH_3S(O)$—.

4,464,386

INSECTICIDAL 3-DIFLUOROMETHOXYPHENYL-1-PHENYLCARBAMOYL-2-PYRAZOLINES

Kiyomi Ozawa; Yasuyuki Nakajima; Makoto Tsugeno; Shigeru Ishii, and Masataka Hatanaka, all of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

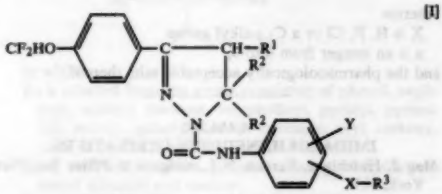
Continuation-in-part of Ser. No. 292,710, Aug. 13, 1981, Pat. No. 4,407,813. This application Jan. 5, 1983, Ser. No. 455,735

Int. Cl.³ C07D *231/06;* A01N *43/56*

U.S. Cl. 424—273 P **14 Claims**

1. A pyrazoline derivative having the formula

[I]



wherein R^1 represents hydrogen atom, a lower alkyl group, $(CH_2)_nCN$ group, $(CH_2)_nOR$ group, phenyl group or a halogen-substituted phenyl group; R^2 represents hydrogen atom or methyl group; Y represents hydrogen atom or chlorine atom; X represents oxygen atom, sulfur atom, sulfinyl or sulfonyl group; R^3 represents a halogen-substituted lower alkyl group; and n is integer 1 to 3 and R represents a lower alkyl group.

14. An insecticide which comprises a carrier and an insecticidally effective amount of a pyrazoline derivative defined in claim 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 or 13 as an active ingredient.

4,464,387

INSECTICIDAL PHENYL HYDANTOIN COMPOUNDS

Krishen L. Nagpal, Williamsville, N.Y., assignor to Buffalo Color Corp., West Paterson, N.J.

Filed Aug. 6, 1982, Ser. No. 405,739

Int. Cl.³ A61K *31/415;* C07D *233/74, 233/72*

U.S. Cl. 424—273 R **5 Claims**

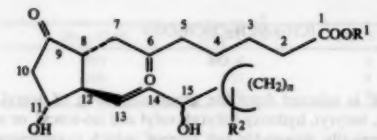
3. A method of killing a pest selected from the group consisting of insects and nematodes comprising contacting said pest with a pesticidal amount of 1-phenyl-3-cyclohexyl hydantoin.

4,464,388
USE OF PROSTAGLANDIN ANALOGUES TO TREAT CYTODAMAGE

Yoshiki Sakai, Osaka; Katsuhiro Imaki, Tsuzuki, and Takashi Muryobayashi, Takatsuki, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

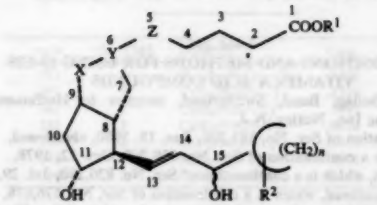
Filed Mar. 23, 1983, Ser. No. 478,031
Claims priority, application Japan, Mar. 25, 1982, 57-46380
Int. Cl.³ A61K *31/38, 31/215, 31/19*
U.S. Cl. 424—275 30 Claims

1. A method for the prevention or treatment of cytodamage associated with liver, pancreatic or kidney disease in a mammalian host which comprises administering to a host subject to, or suffering from, an aforesaid an effective amount of a prostaglandin analogue of the general formula:



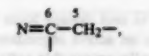
(VA)

or

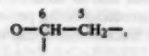


(VB)

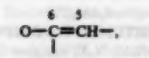
wherein R^1 represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 12 carbon atom(s), R^2 represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 6 carbon atom(s), the symbols ———X—Y—Z— in formula VB represent one of the groups:



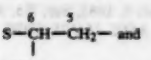
(i)



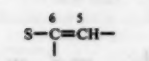
(ii)



(iii)



(iv)



(v)

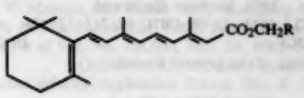
wherein in the formulae (ii) and (iv), the configuration on C_6 is S- or R-configuration or a mixture thereof, and in the general formulae (iii) and (v), the double bond between C_5 and C_6 is in E- or Z-configuration or a mixture thereof, and n represents an integer of from 3 to 5, the double bond between C_{13}–C_{14} is trans, and the hydroxy group attached to C_{15} is in α- or β-configuration or a mixture thereof or, when R^1 represents a hydrogen atom, non-toxic salt thereof, or cyclodextrin clathrate thereof.

4,464,389
ESTERS OF RETINOIC ACID AND PENTAERYTHRITOL AND MONOBENZAL ACETALS THEREOF

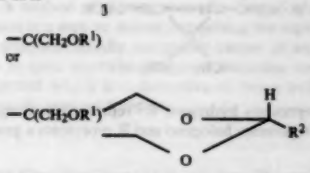
Marcia I. Dawson, Los Altos, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Oct. 20, 1982, Ser. No. 435,415
Int. Cl.³ A61K *31/335, 31/215;* C07C *69/74;* C07D *319/06*
U.S. Cl. 424—278 33 Claims

1. A retinoic acid ester of the formula:



where R is



and R^1 is individually hydrogen or carbacyl and R^2 is phenyl.

7. A chemopreventive composition for inhibiting tumor promotion in epithelial cells in a living animal comprising a tumor promotion inhibiting amount of the compound of claim 1 combined with a pharmaceutically acceptable carrier.

13. A therapeutic composition for treating a nonmalignant skin disorder comprising a therapeutically effective amount of the compound of claim 1 combined with a pharmaceutically acceptable carrier.

19. A method of inhibiting tumor promotion in epithelial cells of a living animal comprising administering a tumor promotion inhibiting amount of the compound of claim 1 to the animal.

26. A method of treating a living animal for a nonmalignant skin disorder comprising administering a therapeutically effective amount of the compound of claim 1 to the animal.

4,464,390
CONTROL OF PARASITIC MITES WITH ALKYL CARBAMATES

Jan Kochansky, Adelphi, Md., and Fred C. Wright, Kerrville, Tex., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 23, 1982, Ser. No. 443,995
Int. Cl.³ A01N *47/10*
U.S. Cl. 424—300 7 Claims

1. A method of controlling scabies mites and other parasitic mites comprising applying to said mites a miticidally effective amount of a compound of the formula,

wherein each of R and R′ is a straight or branched chain alkyl group having from one to twenty carbon atoms and wherein the total number of carbon atoms in R and R′ combined is from six to twenty-four, and X and X′ are individually oxygen or sulfur.

4,464,391

PESTICIDES

Michael Elliott, Stevenage; Norman F. Janes, Luton, and David A. Pulman, Harpenden, all of England, assignors to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 40,304, May 18, 1979, abandoned, Ser. No. 962,025, Nov. 20, 1978, abandoned, and Ser. No. 764,895, Feb. 2, 1977, abandoned, said Ser. No. 764,895, is a division of Ser. No. 497,056, Aug. 13, 1974, Pat. No. 4,024,163, which is a continuation-in-part of Ser. No. 363,318, May 24, 1973, abandoned. This application Jul. 28, 1980, Ser. No. 172,943

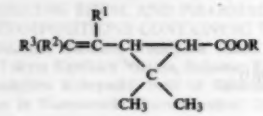
Claims priority, application United Kingdom, May 25, 1978, 22638/78; May 25, 1978, 22639/78

The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.

Int. Cl.³ A01N *53/00*; C07C *69/743, 121/75*

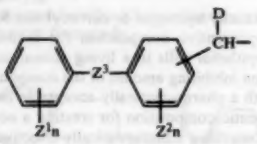
U.S. Cl. 424—304 10 Claims

1. A compound of the general formula:



II

wherein R^1 represents hydrogen, R^2 represents hydrogen or halogeno, R^3 represents halogeno and R represents a group of formula:



VI

wherein D represents H, CN or C≡CH, Z^3 represents 0, Z^1 and Z^2 independently represents chlorine or methyl and n=0, 1 or 2, there being at least one up to three chloro and/or methyl substituents present.

10. A method of pest control which comprises applying to a pest or an environment susceptible to pest attack a compound according to claim 1.

4,464,392

PROCESS FOR CONTROLLING ANTIMICROBIAL ACTIVITY USING GLYCOLIC ACID DERIVATIVES

August V. Bailey, New Orleans; Gordon J. Boudreaux, Metairie, and Gene Sumrell, New Orleans, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 308,743, Oct. 5, 1981, which is a division of Ser. No. 235,812, Feb. 19, 1981, Pat. No. 4,346,043. This application Sep. 24, 1982, Ser. No. 423,403

Int. Cl.³ A01N *37/02*

U.S. Cl. 424—313 5 Claims

1. A process for controlling microbial activity comprising effective an amount of an antimicrobial (composition) compound, selected from the group consisting of:
N,N-bis(pelargonoyloxyethyl)pelargonoyloxyacetamide,
N,N-bis(lauroyloxyethyl)lauroyloxyacetamide,
N,N-bis(oleoyloxyethyl)oleoyloxyacetamide,
N,N-bis(trimethylacetyloxyethyl)trimethylacetylacetamide
carboethoxymethyl hydrocinnamate, and
bis(carbomethoxymethyl) adipate.

4,464,393

USE OF ALKANOYL L-CARNITINES IN THE THERAPEUTICAL TREATMENT OF MYOPATHIES AND MUSCULAR DYSTROPHIES

Claudio Cavazza, Rome, Italy, assignor to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

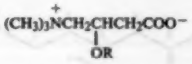
Filed Dec. 5, 1983, Ser. No. 558,107

Claims priority, application Italy, Dec. 9, 1982, 49644 A/82

Int. Cl.³ A61K *31/205*

U.S. Cl. 424—316 2 Claims

1. A method of treating a human affected by myopathy or muscular dystrophy which comprises orally or parenterally administering to the human in a single or multiple dose administration regimen an amount of an alkanoyl L-carnitine of formula



wherein R is selected from the group consisting of acetyl, propionyl, butyryl, hydroxy-butyryl, valyl and iso-leucyl, or a pharmaceutically acceptable salt thereof, which is sufficient upon administration according to said regimen to achieve in said patient an anti-myopathic or anti-dystrophic effect.

4,464,394

COMPOSITIONS AND METHODS FOR USING 13-CIS VITAMIN A ACID COMPOUNDS

Werner Bollag, Basel, Switzerland, assignor to Hoffmann LaRoche Inc., Nutley, N.J.

Continuation of Ser. No. 161,200, Jun. 19, 1980, abandoned, which is a continuation of Ser. No. 950,760, Oct. 12, 1978, abandoned, which is a continuation of Ser. No. 820,280, Jul. 29, 1977, abandoned, which is a continuation of Ser. No. 676,078, Apr. 12, 1976, abandoned, which is a continuation of Ser. No. 535,602, Dec. 23, 1974, abandoned, which is a continuation of Ser. No. 384,848, Aug. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 49,976, Jun. 25, 1970, abandoned. This application Jul. 15, 1981, Ser. No. 283,585

Claims priority, application Switzerland, Jun. 23, 1970, 9474/70

Int. Cl.³ A61K *31/19*

U.S. Cl. 424—317 13 Claims

10. A composition in unit dosage form for enteral administration comprising as an active ingredient 13-cis Vitamin A acid or pharmaceutically acceptable salts thereof and a pharmaceutically acceptable carrier suitable for enteral administration, said active ingredient being present in said composition in an amount of from about 5 mg to about 50 mg.

4,464,395

ANTIHYPERTENSIVE COMPOUND 176

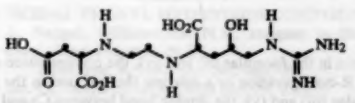
Leeyuan Huang, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 5, 1982, Ser. No. 365,743

Int. Cl.³ A61K *31/195*; C07C *129/12*

U.S. Cl. 424—319 3 Claims

1. The antihypertensive compound 176 having the structural formula:



and which has the following chemical-physical characteristics in its essentially pure form:

(a) crystalline compound—needles from cold water,

(b) tlc (butanol:methanol:water—2:1:1) on silica gel; single spot R_f=0.05,
(c) UV (100 μg/ml)—end only adsorption,
(d) moderate solubility in water and aqueous lower alkanol solutions,
(e) insolubility in the lower alkanols and apolar solvents,
(f) mass spectral data on the purified antihypertensive compound 176 indicates a molecular formula of $C_{12}H_{23}N_5O_7$ with a molecular weight of 349;
(g) field adsorption (FD) mass spectral data indicates the following data: $(M+H)^+$350; $(M-H_2O+H)^+$332
(h) TMS derivatization with BSTFA/pyridine at 90° C. for 3 hours yields predominantly: M/e 781=349 TMS_6 (D_9-TMS m/e 835) species; further derivitization is suggested by the following ions:

H_9–TMS	D_9—TMS	No. TMS
853	916	7
925	997	8
997	1078	9

(i) high resolution mass spectral elemental compositions of the principal ions for the predominant m/e 781 349 TMS_6) species are:

m/e	No. TMS	Formula	Calc.	Found
781	6	$C_{12}H_{23}N_5O_7$—T_6	.3973	.3980
491	4	$C_7H_{15}N_4O_3$—T_4	.2728	.2720
362	3	$C_5H_8NO_4$—T_3	.1640	.1650
332	3	$C_4H_{10}N_3O$—T_3	.2012	.2012
290	2	$C_5H_8NO_4$—T_2	.1245	.1246
242	2	$C_4H_8N_3$—T_2	.1503	.1485
216	2	$C_2H_6N_3$—T_2	.1347	.1344

(j) the 300 MHz proton NMR spectrum shown in FIG. 1;
(k) the infrared spectrum shown in FIG. 2.

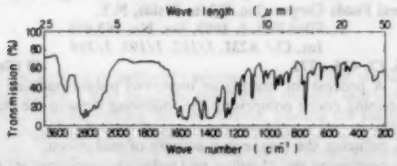
2. A pharmaceutical composition for treating hypertension in humans comprising an effective amount of the antihypertensive compound 176 of claim 1 and a pharmaceutical carrier.

4,464,396

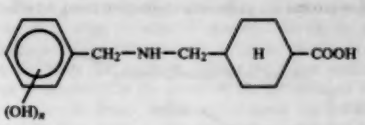
4-[N-(HYDROXYBENZYL)AMINOMETHYL]CYCLOHEXANE-1-CARBOXYLIC ACID

Hitoshi Takita; Yutaka Mukaida; Sakuo Noda, and Hidetoshi Kobayashi, all of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 10, 1982, Ser. No. 440,616
Claims priority, application Japan, Nov. 20, 1981, 56-186691
Int. Cl.³ C07C *101/30*; A61K *31/195*
U.S. Cl. 424—319 **16 Claims**



1. 4-[N-(hydroxybenzyl)aminomethyl]cyclohexane-1-carboxylic acid represented by the general formula (I):



wherein n is an integer of 1 to 3, or a salt or an ester thereof.

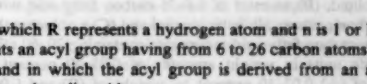
4,464,397

DERIVATIVES OF LYSINE AND ASPARTIC ACID

Jean V. Morelle, and Eliane M. T. Lauzanne-Morelle, both of 170, Avenue Parmentier, 75010 Paris, France

Division of Ser. No. 324,004, Nov. 23, 1981. This application Oct. 29, 1983, Ser. No. 543,217
Claims priority, application France, Dec. 4, 1980, 80 25732
Int. Cl.³ A61M *31/185*
U.S. Cl. 424—319 **8 Claims**

1. A method of treating muscular fatigue or muscular contraction in a man or animal comprising the topical application in a pharmaceutically acceptable carrier of an amount sufficient to treat muscular fatigue or muscular contraction of a compound which is a derivative of lysine and aspartic acid having the general formula



in which R represents a hydrogen atom and n is 1 or R represents an acyl group having from 6 to 26 carbon atoms and n is 2 and in which the acyl group is derived from an aliphatic moncarboxylic acid.

4,464,398

GERMICIDE AND AN IMPROVED METHOD FOR KILLING BACTERIA, FUNGUS AND/OR VIRUSES

Richard D. Sheets, and Donald R. Huffman, both of Huntington, Ind., assignors to Huntington Laboratories, Inc., Huntington, Ind.

Filed Aug. 11, 1981, Ser. No. 291,984
Int. Cl.³ A61K *31/14*
U.S. Cl. 424—329 **18 Claims**

1. A germicide composition both germicidally active in hard water and germicidially active in the presence of up to about 5% organic soil when present in an amount of at least 300 ppm in an aqueous solution, comprising a blend of didecyl dimethyl ammonium chloride and n-alkyl (C14 50%, C12 40%, C16 10%) dimethyl benzyl ammonium chloride, said didecyl dimethyl ammonium chloride and n-alkyl (C14 50%, C12 40%, C16 10%) dimethyl benzyl ammonium chloride being present in about a 60/40 weight ratio.

4,464,399

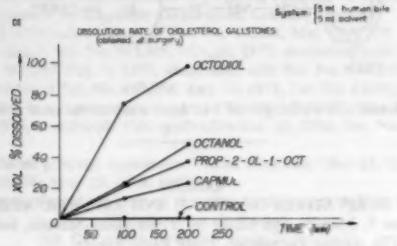
OCTODIOL, A SOLVENT FOR DIRECT DISSOLUTION OF CHOLESTEROL GALLSTONES

Alan F. Hofmann, La Jolla, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Jun. 21, 1983, Ser. No. 506,424
Int. Cl.³ A61K *31/08*, *31/10*, *31/16*
U.S. Cl. 424—342 **6 Claims**

1. The method of treating gallstones in a human afflicted

with gallstones which comprises administering to said human by infusion around the gallstones to dissolve them, an effective



amount for treating gallstones, of the monooctyl ether of glycerol having the formula $C_8H_{17}OCH_2CHOHCH_2OH$.

4,464,400

SKIN CARE BASE MATERIAL FOR EXTERNAL USE

Kuniko Kimura, Tokyo; Kunihiko Ofuchi, and Koichiro Oda, both of Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Mar. 16, 1982, Ser. No. 358,588
Claims priority, application Japan, Apr. 8, 1981, 56-52732
Int. Cl.³ A61K *7/46, 47/00*
U.S. Cl. 424—365 **10 Claims**

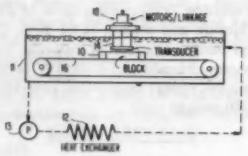
1. A skin care base material composition for application to the external surface of skin which consists essentially of (A) a phospholipid, (B) an ester of a 8–26 carbon fatty acid with a 8–22 carbon primary aliphatic alcohol and (C) a polyoxyethylene 8–26 carbon fatty acid monoester containing 20–60 ethylene oxide units in weight amounts of 0.05–20 percent by weight of (A) 0.02–10 percent by weight of (B) and 0.01–5 percent by weight of (C), based on the weight of the entire composition and the balance of the composition comprises a cosmetic carrier.

4,464,401

ACOUSTIC THAWING OF FROZEN FOOD

Allan D. Kissam, Seattle, Wash., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Apr. 22, 1982, Ser. No. 370,772
Int. Cl.³ A23L *3/30*
U.S. Cl. 426—238 **6 Claims**



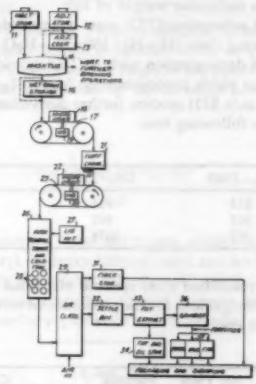
1. A method of rapidly thawing frozen food without localized heating thereof comprising immersing the frozen food in a water bath at a maximum temperature of about 18° C. and subjecting the food to a maximum of about 6 watts of acoustic power having a frequency equal to the relaxation frequency of the crystalline ice in the frozen food and less than about 10 kHz.

4,464,402

PROCESS FOR MANUFACTURING A HIGH PROTEIN FOOD MATERIAL

James J. Gannon, Hawley, Pa., assignor to F.I.N.D. Research Corporation, New York, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,171
Int. Cl.³ A23L *1/10*; A23J *1/12*
U.S. Cl. 426—242 **3 Claims**



1. The process of making high-protein materials suitable for production of food suitable for humans, the process comprising the steps of:

directing microwave energy into a mass comprising substantially exclusively soggy spent grains produced in a mashing operation in which a substantial proportion of fermentables have been removed from the grains, said soggy spent grains having at least approximately 70% moisture by weight, said microwave energy being sufficiently intense to vaporize moisture associated with said spent grains without adversely affecting the nutritional profile of the spent grains;

continuing the application of microwave energy to dry the spent grains until the moisture content thereof is reduced to approximately 5 to 10% by weight;

removing the substantially dry spent grains from the path of microwave transmission;

subjecting the substantially dry spent grains to a temperature sufficiently low to embrittle the same; and

exerting mechanical force on the embrittled grains while maintaining those grains at a sufficiently low temperature to keep them embrittled.

4,464,403

INSTANT PUDDING COMPOSITION CONTAINING COCOA AND PROCESS

Richard R. Leshik, Ewing; Bala S. Iyer, Mercerville, both of N.J., and John R. Carpenter, Hershey, Pa., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 3, 1983, Ser. No. 463,466
Int. Cl.³ A23L *1/187, 1/195, 1/234*
U.S. Cl. 426—271 **10 Claims**

1. A process for making an improved instant pudding mix containing cocoa comprising the following steps in the stated order:

a. reducing the magnesium activity of said cocoa;

b. combining and blending said reduced magnesium activity cocoa with sugar, pregelatinized starch, and a setting agent; and

c. packaging said combination.

4,464,404

PROCESSES FOR PRODUCTION OF REFRIGERATED MINCED FISH FLESH AND FISH PASTE PRODUCT HAVING IMPROVED QUALITY

Ryuzo Ueno, Nishinimiya; Tatsuo Kanayama; Kunihiko Tomiyasu, both of Takarazuka; Asao Fujikami, and Toshitaka Nakashima, both of Nishinomiya, all of Japan, assignors to Ueno Fine Chemicals Industry, Ltd., Osaka, Japan

Filed Sep. 28, 1982, Ser. No. 426,093

Claims priority, application Japan, Oct. 1, 1981, 56-154832; Dec. 3, 1981, 56-193688

Int. Cl.³ A22C *25/00*

U.S. Cl. 426—332 9 Claims

1. A process for producing a refrigerated minced flesh of fish, which comprises adding (a) sugar and/or a sugar alcohol in an amount of about 2 to about 15% by weight and (b) lactalbumin in an amount of about 0.2 to about 5% by weight and/or blood plasma in an amount of about 0.1 to about 3% by weight to a dewatered fish flesh, mincing the mixture and then refrigerating the minced product.

4,464,405

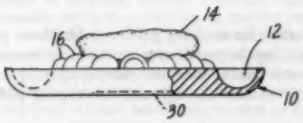
METHOD FOR MAKING PIZZA SHELLS

Eugene L. De Christopher, P.O. Box 1066, Belvedere, Calif. 94920

Filed May 24, 1982, Ser. No. 381,457

Int. Cl.³ A21D *8/02, 8/06*

U.S. Cl. 426—391 6 Claims



1. In the method of making a shell or like product of bread dough, the steps of:

providing a mold with a plurality of upwardly projecting protuberances and a groove around the edges thereof;

applying a thick mass of dough on top of said mold; and

proofing said dough within said mold for a period of time to enable said dough to expand into said groove and to occupy spaces between said protuberances.

4,464,406

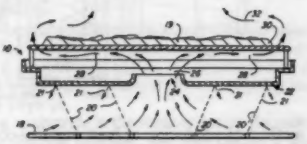
METHOD FOR PREPARING PIZZA IN A BAKING OVEN

Richard L. Pierick, 3256 Hampshire Ave. N., Minneapolis, Minn. 55427

Division of Ser. No. 261,511, May 7, 1981, Pat. No. 4,384,513. This application Sep. 30, 1982, Ser. No. 430,037

Int. Cl.³ A21D *8/00;* A23L *1/00*

U.S. Cl. 426—496 9 Claims



1. A method of uniformly heating pizza in a hot air baking oven having a heat source at the bottom thereof, said method comprising; energizing the heat source, placing the pizza in a horizontal plane and supporting it throughout its width and breadth at a point within the oven above the heat source while exposing the entire lower surface of the pizza to access by air moving within the oven during the cooking operation, shielding the peripheral edge of the pizza from direct exposure to infrared radiation emanating from the heat source located below the pizza, closing the oven, ducting at least part of the hot air rising upwardly from the heat source toward the middle of the pizza while the pizza is centered over the ducted air to thereby provide a rising column of hot air smaller in diameter than the pizza that impinges against the lower surface of the pizza at substantially its center to disrupt adhered boundary layer air on the lower surface of the pizza, the hot air is then caused to flow through free convection produced by differences in air density resulting from temperature changes, said air being thereby free to spread radially outward in a horizontal plane across the lower surface of the pizza and then flow upwardly around the shielded peripheral edge thereof toward the top of the oven whereby the pizza is cooked uniformly across its bottom surface almost entirely by hot air convection without overcooking its peripheral edge.

4,464,407

FLAVORING COMPOSITIONS

Jau Y. Hsu, Brookfield, Conn., assignor to Societe D'Assistance Technique Pour Produits Nestle S.A., Lausanne, Switzerland

Continuation of Ser. No. 353,393, Mar. 1, 1982, abandoned. This application Nov. 8, 1983, Ser. No. 549,654

Int. Cl.³ A23L *1/22*

U.S. Cl. 426—533 9 Claims

1. A flavouring composition characterised in that it comprises a mixture prepared

(a) from 10 to 80% by weight of a lactic acid fermented vegetable juice and from 20 to 90% by weight of a hydrolysed protein based on the weight of the mixture or

(b) from 2 to 80% by weight of a dehydrated lactic acid fermented vegetable and from 20 to 98% by weight of a hydrolysed protein based on the weight of the mixture, wherein in the combination of (a) or (b) the fermented vegetable material imparts an appetizing sour note and a meat and vegetable flavor.

4,464,408

USES OF METHYL SUBSTITUTED 2-(2,6-DIMETHYL-1,5-HEPTADIENYL)-1,3-DITHIOLANES IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF FOODSTUFFS

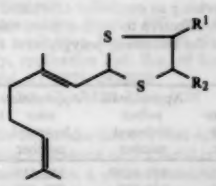
Alan O. Pittet, Atlantic Highlands; Manfred H. Vock, Locust; Thomas F. Courtney, Jr., Oakhurst, and Ranya Muralidhara, Fair Haven, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sep. 19, 1983, Ser. No. 533,667

Int. Cl.³ A23L *1/231*

U.S. Cl. 426—535 6 Claims

1. A process for agumenting or enhancing the aroma or taste of a foodstuff comprising adding to said foodstuff about 0.1 parts per million up to about 250 parts per million of at least one methyl substituted 2-(2,6-dimethyl-1,5-heptadienyl)-1,3-dithiolane defined according to the structure:



wherein R_1 and R_2 are the same or different and each represents methyl or hydrogen with the proviso that at least one of R_1 and R_2 is methyl.

4,464,409

PROCESS FOR PREPARING 4-HYDROXY-5-METHYL-2,3-DIHYDRO-FURANONE-3 AND CHANGING ORGANOLEPTIC PROPERTIES OF FOODS

Johannes F. M. de Rooij, Maassluis, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Filed Feb. 16, 1982, Ser. No. 349,429

Claims priority, application Netherlands, Feb. 19, 1981, 8100815

Int. Cl.³ A23L *1/226, 1/231;* C07D *307/60*

U.S. Cl. 426—536 13 Claims

1. A process for preparing 4-hydroxy-5-methyl-2,3-dihydrofuranone-3, which comprises heating a solution of a 5-keto-aldohexonic acid or a derivative thereof in a polar solvent at a pH value between 1 and 7 to a temperature of 70° C. to 150° C.

7. A process for changing the organoleptic properties of a foodstuff or an ingredient for a foodstuff which before consumption has a pH value between 5 and 7 and which has to be heated for at least 15 minutes at a temperature of at least 70° C., characterized in that from 30 ppm to 2000 ppm, calculated on the weight of the foodstuff or the ingredient for the foodstuff, of a 5-keto-aldohexonic acid or its derivative, calculated as the acid, are incorporated into the foodstuff or the ingredient therefor.

4,464,410

MICROBIAL HETEROPOLYSACCHARIDE

Roger B. Cox, Reading, and David C. Steer, Wirral, both of England, assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 331,705, Dec. 16, 1981, which is a division of Ser. No. 166,220, Jul. 7, 1980, Pat. No. 4,329,448. This application Aug. 23, 1982, Ser. No. 410,793

Claims priority, application United Kingdom, Jul. 10, 1979, 7924040; Dec. 20, 1979, 7943878

Int. Cl.³ A23L *1/04*

U.S. Cl. 426—573 2 Claims

1. A dehydrated food product comprising dry Biopolymer PS 87 said Biopolymer PS 87 being a heteropolysaccharide which comprises from 40 to 45% by weight of glucose, from 10 to 20% by weight galactose, from 25 to 30% by weight mannose, from 6 to 13% by weight glucuronic acid and from 0 to 1.5% by weight fucose, a 1% by weight solution of said Biopolymer PS 87 having pseudoplastic properties, a consistency at 20° C. of at least 150 poise and a yield stress value at 20° C. of at least 30 dynes/cm^2.

4,464,411

CONFECTIONARY COATING COMPOSITIONS CONTAINING POLYGLYCEROL ESTER EMULSIFIERS

Anthony G. Herzing, Middleburg Heights, and Nickolas Palamidis, Strongsville, both of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed Nov. 5, 1982, Ser. No. 439,336

Int. Cl.³ A23D *5/00*

U.S. Cl. 426—613 5 Claims

1. In a confectionery coating composition comprising lauric or non-lauric hard butters, flavors and emulsifiers, the improvement comprising an emulsifier of a blend of polyglycerol esters in amounts effective to form a gloss, said blend consisting essentially of the following polyglycerol esters:

Polyglycerol esters	Approximate parts	Approximate polyol hydroxyl number	Approximate ester hydroxyl number	Average degree of polymerization
(a)	0–35	970–1350	340–410	2–6
(b)	30–60	880–970	400–600	6–10
(c)	30–60	880–970	400–600	6–10

said compounds being prepared by interesterification of polyglycerol with fat or oil or by direct esterification with a fatty acid; the fat, oil, or fatty acid of compounds (a) and (b) being a 0–5 IV stearine or fatty acid; the fat, oil, or fatty acid of compound (c) being partially hydrogenated, in which 60–95% of the fatty acids are a combination of oleic and elaidic acids.

4,464,412

DEFIBRILLATOR GEL DISPENSER

Jack S. Washburn, 1414 Sunset Ave. Extension, Asheboro, N.C. 27203

Filed Oct. 21, 1982, Ser. No. 435,674

Int. Cl.³ G01R *27/02;* A61B *5/04;* A01N *1/02*

U.S. Cl. 427—2 9 Claims

6. A method for applying gel to a defibrillator paddle comprising: guiding the paddle onto an activator means, activating said activator means with the paddle, opening a valve and allowing gel to flow through said valve to the paddle.

4,464,413

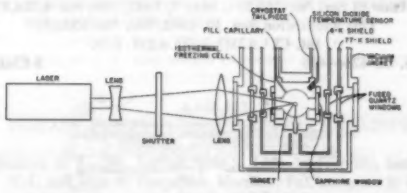
METHOD AND APPARATUS FOR PRODUCING CRYOGENIC TARGETS

James T. Murphy, Los Alamos, N. Mex., and John R. Miller, Penfield, N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 28, 1981, Ser. No. 297,477

Int. Cl.³ G21C *3/06*

U.S. Cl. 427—6 11 Claims



1. In a method of producing at least one fuel-coated inertially driven cryogenic neutron generating microballoon target within a cryogenic region, using the fast isothermal freezing method, the method comprising:

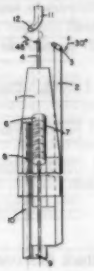
conducting heat to said at least one target by means of light which passes through an optical fiber having a first end and a second end, said second end of said optical fiber being located within said cryogenic region and positioned so that said second end is in close proximity to said target and so that light exiting from said second end contacts said target but only minimally disturbs said cryogenic region.

4,464,414

METHOD FOR SPRAYING METALLIC COATINGS, ESPECIALLY ON DIFFICULT ACCESSIBLE SURFACES

Witold Mlewski; Jerzy Brennek; Lech Stanikowski; Wojciech Kunicki; Wieslaw Sapiezynski; Andrzej Konopczynski, and Zbigniew Kondratowicz, all of Warsaw, Poland, assignors to Instytut Mechaniki Precyzyjnej, Warsaw, Poland

Filed Jan. 21, 1983, Ser. No. 459,819
Claims priority, application Poland, Jul. 26, 1982, 237654
Int. Cl.³ B05D 3/06
U.S. Cl. 427—37 2 Claims



1. A method of spraying metallic coatings, especially on difficult-accessible surfaces, consisting in melting metal in an electric arc produced between wires constituting meltable electrodes mounted in a metal spraying head and in atomizing molten metal by a stream of compressed gas and transferring it onto the surface being coated, performing in relation to the metal spraying head relative translatory motion or translatory and rotary motion, characterized in that molten metal is applied on the surface by means of a closed system of three-stream atomization which comprises a central stream of compressed gas directed along wires being melted, a side stream of compressed gas directed at an angle to the surface being coated and cocurrently to its translatory motion, and a blowing-away stream of compressed gas directed at an angle to the surface being coated and counter-currently to the translatory motion thereof, and the amount of gas forming the said blowing-away stream is 10–30% of the other amount of gas.

4,464,415

PHOTOELECTRIC CONVERSION SEMICONDUCTOR MANUFACTURING METHOD

Shunpei Yamazaki, 21-21 Kitakarasuyama 7-chome, Setagaya-ku, Tokyo, Japan

Division of Ser. No. 237,609, Feb. 24, 1981, Pat. No. 4,409,134. This application Mar. 1, 1982, Ser. No. 353,335
Claims priority, application Japan, Mar. 3, 1980, 55-26388
Int. Cl.³ G03G 5/082
U.S. Cl. 427—39 8 Claims

7. A photoelectric conversion semiconductor manufacturing method which employs a reaction chamber provided with a gas inlet, a gas ionizing region, a semiconductor depositing region and a gas outlet arranged in the foregoing order; comprising the steps of

disposing a substrate in the semiconductor depositing region of the reaction chamber, and introducing a gas mixture containing at least a semiconductor material gas which includes a dangling bond neutralizer into the gas ionizing region of the reaction chamber through the gas inlet thereof;

applying, in the gas ionizing region of the reaction chamber, an ionizing, high-frequency electromagnetic field to the gas mixture to ionize it into a gas mixture plasma;

passing the gas mixture plasma into the semiconductor depositing region of the reaction chamber;

depositing the semiconductor material on the substrate from the gas mixture plasma passed into the semiconductor depositing region where the atmospheric pressure in the reaction chamber is held below 1 atm and the temperature of the substrate is maintained lower than the crystallizing temperature of the deposited semiconductor material to thereby form a photoelectric conversion semiconductor which comprises a mixture of a microcrystalline semiconductor material and a non-crystalline semiconductor material and which is doped with the dangling bond neutralizer; and

exhausting the unused gas through the gas outlet.

4,464,416

METHOD OF FORMING METALLIC COATINGS ON POLYMERIC SUBSTRATES

Raimond Liepins, Los Alamos, N. Mex., assignor to The United States of America as represented by the Depart of Energy, Washington, D.C.

Division of Ser. No. 242,807, Mar. 11, 1981, Pat. No. 4,390,567. This application Feb. 16, 1983, Ser. No. 467,104
Int. Cl.³ B05D 3/06
U.S. Cl. 427—40 7 Claims

1. A method of forming a metallic coating on a polymeric substrate, comprising the steps of (a) contacting said polymeric substrate with a fluid containing a metal compound or mixture of metal compounds at a temperature below 150° C. for a time sufficient for said metal compound or mixture of metal compounds to sorb or diffuse into said polymeric substrate, and (b) subjecting said substrate containing said sorbed or diffused metal to a low pressure plasma for a time sufficient to form a metallic coating on said substrate.

4,464,417

METHOD FOR MINIMIZING CONTAMINANT PARTICLE EFFECTS IN GAS-INSULATED ELECTRICAL APPARATUS

Marshall O. Pace; James L. Adcock, both of Knoxville, and Loucas G. Christophorou, Oak Ridge, all of Tenn., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Feb. 2, 1983, Ser. No. 463,208
Int. Cl.³ B05D 3/14
U.S. Cl. 427—41 3 Claims

1. A method for preventing a reduction in the dielectric strength of a gas insulator in high voltage electrical apparatus resulting from the inclusion of electrically conductive or semiconductive particles therein, comprising placing an electrical insulative coating on said particles while said gas insulator is in said apparatus.

4,464,418

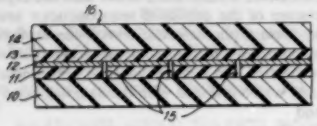
HEAT REFLECTING WALL PAPER OR WALL COVERING

Gunther Pusch, Bannholzweg 12, 6903 Neckargemünd 2; Dieter E. Aisslinger, Heidestr. 54, 6222 Geisenheim; Alexander Hoffmann, Schlossstr. 32, 6909 Rotenberg, and Klaus-Werner Pusch, Jakob-Bernhard-Str. 3 a, 6903 Neckargemünd 2, all of Fed. Rep. of Germany

Continuation-in-part of Ser. No. 137,507, Apr. 4, 1980, Pat. No. 4,340,634. This application Jun. 24, 1981, Ser. No. 276,791
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1979, 2914436; Jul. 17, 1979, 2928848
Int. Cl.³ B32B 3/10, 3/28
U.S. Cl. 427—44 9 Claims

1. A method for the production of a heat-reflecting covering comprising coating a substrate with a metal coat in a thickness of less than 30 nanometers, a veneer protecting coat having a thickness of about 0.5–2.0 μm and a veneer coat having a thickness of about 1.5 to 2.0 μm, both of said veneer protecting coat and said veneer coat being substantially transparent in the wavelength range of 4 to 20 μm, wherein the metal-coated

substrate is treated so as to cause it to create distinct breaks in the metal layer surface so that the metal layer thereon will be



effectively of such high ohmic resistance as to be electrically non-conductive.

4,464,419

PROCESS FOR A LOW BACK-ACTION, QUASI-HERMETIC COVERING OF SUSCEPTIBLE PHYSICAL STRUCTURES

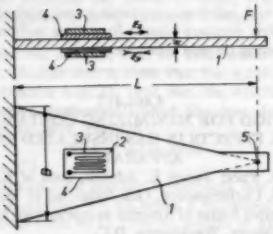
Klaus Horn, Brunswick, Fed. Rep. of Germany, assignor to Industrie Automation Wäge- und Prozesstechnik GmbH & Co., Heidelberg, Fed. Rep. of Germany

Filed Sep. 14, 1982, Ser. No. 418,245

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1982, 3212738

Int. Cl.³ H05D *5/12*; H05K *5/00*

U.S. Cl. 427—58 **19 Claims**



1. A method for quasi-hermetically covering a sensitive physical structure on structure support surfaces with low back-action on said sensitive structure to protect the same against soiling, chemical attack and/or physical interferences, in particular against the effect of humidity and structure-deforming gases, which comprises covering said structure with an extremely thin film of one micron or less of a vacuum-tight, inorganic material as the covering material which film is made to intimately combine both with the structure to be protected and with the support in large-area surface zones in the immediate vicinity of the structure.

4,464,420

CERAMIC MULTILAYER CIRCUIT BOARD AND A PROCESS FOR MANUFACTURING THE SAME

Noriyuki Taguchi; Tsuyoshi Fuzita, both of Yokohama; Gyozo Toda, Hino; Syoosaku Ishihara, Yokohama; Takashi Kuroki, Yokohama, and Tatsuhiro Suzuki, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

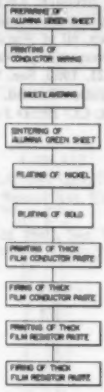
Filed Sep. 23, 1982, Ser. No. 421,833

Claims priority, application Japan, Sep. 24, 1981, 56-149484

Int. Cl.³ B05D *5/12*

U.S. Cl. 427—96 **9 Claims**

1. A process for manufacturing a ceramic multilayer circuit board which comprises the steps of providing a ceramic multilayer wiring substrate by the green sheet process, sintering said substrate, nickel plating and gold plating in this order on a tungsten, molybdenum or molybdenum-manganese superficial wiring conductor layer on at least one of the top and bottom insulative layers, printing an Ag-Pt or Ag-Pd-containing thick film conductor paste on the gold plating layer, firing the printed substrate and finally printing a thick film resistor paste


PREPARING OF ALUMINA GREEN SHEET
PRINTING OF CONDUCTOR WIRING
MULTILAYERING
SINTERING OF ALUMINA GREEN SHEET
PLATING OF NICKEL
PLATING OF GOLD
PRINTING OF THICK FILM CONDUCTOR PASTE
FIRING OF THICK FILM CONDUCTOR PASTE
PRINTING OF THICK FILM RESISTOR PASTE
FIRING OF THICK FILM RESISTOR PASTE

on at least part of the thick film conductor layer and firing to form a thick film resistor layer.

4,464,421

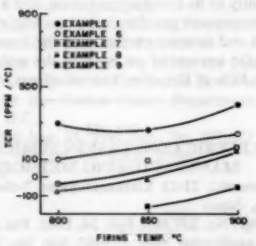
GLASS FRITS CONTAINING WO_3 OR MOO_3 IN RUO_2-BASED RESISTORS

Robert G. Howell, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 345,574, Feb. 4, 1982, Pat. No. 4,436,829. This application Oct. 28, 1983, Ser. No. 546,321

Int. Cl.³ H01C *7/00, 17/06, 17/30*

U.S. Cl. 427—102 **4 Claims**



1. A method for making thick film RuO_2-based resistors exhibiting temperature coefficient of resistant values of less than 100 ppm which comprises the steps of:

(a) forming a glass frit consisting, expressed in terms of mole percent on the oxide basis, of about 32–39% PbO, 44–47% B_2O_3, 14–17% SiO_2, and an effective amount up to 5% of WO_3 or MoO_3;

(b) mixing said glass frit with RuO_2 powder;

(c) blending a vehicle for silk screening into said mixture of glass frit and RuO_2 powder;

(d) silk screening said blend onto an alumina substrate in a manner to form a film which overlaps previously-applied conductors;

(e) drying said film, and then

(f) firing said film at temperatures of 750°–950° C. for a period of time sufficient to fuse said glass frit into a sound coating and cause the growth of $PbWO_4$ or $PbMoO_4$ crystals therein.

4,464,422

PROCESS FOR PREVENTING OXIDATION OF COPPER FILM ON CERAMIC BODY

Atsuo Senda, Otsu; Suehiro Kato, Nagaokakyo, and Toru Kasanami, Tsuzuki, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Nov. 9, 1982, Ser. No. 440,302
Int. Cl.³ B05D 5/12
U.S. Cl. 427—124 12 Claims

1. A process for preventing oxidation of a copper film which has been formed on a ceramic body by a dry-plating process, which comprises contacting said copper film with a deactivating agent comprising at least one volatile hydrocarbon halide monomer in an evacuated vacuum chamber of the dry-plating apparatus before exposing the copper film on the ceramic body to the atmosphere.

5. The process according to claim 1 wherein the deactivating agent is at least one volatile hydrocarbon halide monomer selected from the group consisting of trichloroethylene, tetrachloroethylene, trichlorofluoromethane, dichlorodifluoromethane, chlorodifluoromethane, 1,1,2-trichloro-1,2,2-trifluoroethane, carbon tetrachloride, methylchloride, methylene chloride, and chlorobenzene.

4,464,423

METHOD FOR FORMING DUAL GLOSS COATING

Michael H. LaBianca, and Thomas G. Smith, both of Easton, Pa., assignors to Tarkett AB, Ronneby, Sweden

Filed Mar. 27, 1981, Ser. No. 248,126
Int. Cl.³ B05D 5/00
U.S. Cl. 427—244 18 Claims

1. Method for forming a dual gloss coating on a substrate which comprises:

(a) applying to the substrate a first, continuous layer of curable polyurethane or PVC plastisol or organosol and at least partially curing same;

(b) then applying with a rotogravure cylinder to selected areas of the surface of the thus at least partially cured continuous layer a second, discontinuous, printed layer of the same or a different curable polyurethane or PVC plastisol or organosol, said rotogravure cylinder having a number of lines per inch sufficient to produce a difference in gloss effect between the discontinuous layer and continuous layer after curing of said layers; and

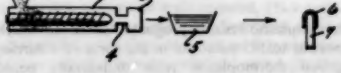
(c) then completing the curing of both said layers.

4,464,424

CONCRETE JOINT SEALANT PLATE AND PROCESS FOR MANUFACTURING THEREOF

Hazime Niwa, and Saburo Furukawa, both of Hiroshima, Japan, assignors to Aoi Chemical, Inc., Hiroshima, Japan

Filed Dec. 22, 1981, Ser. No. 333,561
Int. Cl.³ B05D 1/18, 3/12; C08L 95/00; C09D 3/24
U.S. Cl. 427—296 5 Claims



1. A method for preparing a concrete joint sealant plate, comprising impregnating a fibrous plate with an aqueous asphalt emulsion under a reduced pressure and then drying it by means of a heating presser.

4,464,425

FOAMED POLYMERIC SHRINK-FIT OBJECTS AND THEIR PROCESS OF MANUFACTURE

Hermann U. Voigt, Langenhagen, and Eckard Schleese, Stadthagen, both of Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gütehoffnungshutte Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jan. 19, 1981, Ser. No. 226,539
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1980, 3001159
Int. Cl.³ B29D 27/00
U.S. Cl. 428—35 18 Claims

1. A shrink-fitting article such as a shrink hose, shrink sleeve, or shrink cap, made from a hollow article comprised of an extruded and cross-linked foam material, the hollow article as a whole having been expanded to a larger size following completion of cross-linking and foam expansion.

4,464,426

MULTILAYER FILM HAVING A LAYER OF LOW PRESSURE, LOW DENSITY HETEROGENEOUS ETHYLENE COPOLYMERS

John Anthony, Downers Grove, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 3, 1981, Ser. No. 317,936
Int. Cl.³ B32B 27/00
U.S. Cl. 428—35 10 Claims

1. A coextruded multilayer film comprising a first outer layer of a high pressure, low density polyethylene, a core layer consisting essentially of low pressure, low density gas phase heterogeneous ethylene copolymers formed from ethylene and at least one of propylene and butene-1 and at least one C_5–C_8 comonomer, and a second outer layer comprising a high pressure, low density polyethylene, said copolymers having a melt index of between about 0.5 and about 5.0 decigrams per minute, and a density of between about 0.91 and about 0.94 grams per cubic centimeter.

4,464,427

PREFORMED MEMBRANE

Peter L. Barlow, Guilden Sutton, England, assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 373,830, May 3, 1982, abandoned. This application May 17, 1983, Ser. No. 493,804
Claims priority, application United Kingdom, Jun. 29, 1981, 8119949
Int. Cl.³ B32B 11/00; C08L 91/00
U.S. Cl. 428—40 6 Claims

1. A preformed membrane suitable for road surfacing and maintenance comprising a layer of a mixture of:

(a) a bitumen;

(b) from about 1 to about 10 percent by weight of a linear ABA block copolymer, each block A being a monoalkenyl arene polymer having an average molecular weight between about 7,500 and 100,000, each block B being an isoprene polymer having an average molecular weight between about 25,000 and 1,000,000; and

(c) from about 1 to about 10 percent by weight of a radial $(A'—B')_nB'—A'$ block copolymer, each block A' being a monoalkenyl arene polymer having an average molecular weight between about 7,500 and 100,000, each block B' being a butadiene polymer having an average molecular weight between about 25,000 and 1,000,000, n being over 1.

4,464,428

CLOSED CELL FOAMED MATERIAL HAVING INTERIOR CANALS FILLED WITH SUBSTANCES

Heinrich Ebert, Abtsteinach; Manfred Noe, Laudenbach; Kurt Wind, Weinheim, and Wilhelm Kirsch, Birkenau, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Jul. 23, 1982, Ser. No. 401,341

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1981, 3148710; Dec. 9, 1981, 3148711

Int. Cl.³ B32B *3/10*

U.S. Cl. 428—95 17 Claims

1. In an improved web consisting of a crosslinked plastic material foamed in a closed-cell configuration, said web having substantially parallel upper and lower surfaces, the improvement comprising providing said web with a multiplicity of interior canals which extend and open to at least one of said upper and lower surfaces of said web so as to form distributed patterned interruptions on said surfaces, said canals being filled with subsequently introduced substances selected from the group consisting of solid particulate bodies, bundles of fibers and bundles of filaments.

12. The web of foamed material according to claim 1 wherein at least some of the ends of said fibers and/or filaments protrude beyond the openings of said canals to said upper and/or lower surfaces.

4,464,429

SEMI-FINISHED PRODUCT BASED ON FIBERS PREIMPREGNATED WITH POLYMERIZABLE RESIN

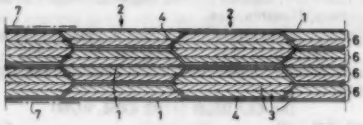
Jean A. Michaud-Soret, Paris, France, assignor to Societe Nationale Industrielle Aerospatiale, France

Filed Oct. 20, 1982, Ser. No. 435,499

Claims priority, application France, Oct. 20, 1981, 81 19706

Int. Cl.³ B32B *3/12*

U.S. Cl. 428—117 5 Claims



1. A semi-finished product which is tacky to the touch and can be used to manufacture finished components, comprising:

a first layer of fabric forming a base web lying in a plane and impregnated with polymerizable resin which is at most partially polymerized so that it is tacky to the touch;

a plurality of distinct strips of rovings impregnated with polymerizable resin which is at most partially polymerized so as to be tacky to the touch arranged in rows and juxtaposed on said fabric lying in the same longitudinal direction; and

a second layer of fabric having a rippled configuration and passing alternately above and below the juxtaposed rows of said strips, said second layer being impregnated with polymerizable resin which is at most partially polymerized so as to be tacky to the touch.

4,464,430

METAL DIFFUSION

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 238,500, Feb. 26, 1981, Pat. No. 4,350,719, abandoned, Ser. No. 71,741, Aug. 30, 1979, Ser. No. 963,313, Nov. 27, 1978, abandoned, Ser. No. 851,504, Nov. 14, 1977, and Ser. No. 809,189, Jun. 23, 1977, Pat. No. 4,308,160, said Ser. No. 809,189, Ser. No. 851,504, Ser. No. 963,313, and Ser. No. 71,471, each is a continuation-in-part of Ser. No. 752,855, Dec. 21, 1976, Pat. No. 4,208,453, Ser. No. 963,313, continuation-in-part of Ser. No. 614,834, Sep. 19, 1975, Pat. No. 4,141,760, Ser. No. 851,504, and Ser. No. 809,189, each is a continuation-in-part of Ser. No. 694,951, Jun. 11, 1976, abandoned, and Ser. No. 614,834, said Ser. No. 614,834, is a continuation-in-part of Ser. No. 466,908, May 3, 1974, Pat No. 3,958,047, which is a continuation-in-part of Ser. No. 328,378, Jan. 31, 1973, Pat. No. 3,867,184. This application Mar. 10, 1981, Ser. No. 242,350

Int. Cl.³ B05D *3/00*

U.S. Cl. 428—201 9 Claims

1. In the method of applying a diffusion coating to a limited portion of the surface of a substrate, the improvement according to which the limited surface portion is delineated by applying a delineating coating and then holding the delineating coating in place by applying over it a sheath-forming layer.

4,464,431

FRICTION-MELT RESISTANT TEXTILE PRODUCT AND PREPARING METHOD THEREOF

Hisao Hisaki, Shiga; Junnosuke Nagashima, Kusatsu, and Katsuo Kanno, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 382,295, May 26, 1982, abandoned. This application Jul. 22, 1983, Ser. No. 516,428

Claims priority, application Japan, Jun. 3, 1981, 56-84282

Int. Cl.³ B32B *7/00*

U.S. Cl. 428—266 27 Claims

1. A method of treating a textile fabric, wherein a synthetic filter fabric or a blended fabric of synthetic and other fibers is treated with an aqueous mixture of a hydrophilic and thermally reactive urethane prepolymer having a blocked isocyanate group and organopolysiloxane.

4,464,432

THERMOPLASTIC RESIN PASTE IMPREGNATED SUBSTRATES

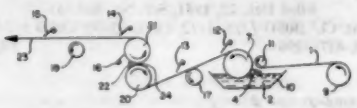
Gerhard Dost, Troisdorf; Walter Gerber, Troisdorf-Spich; Eberhard Jaeger, Heiligenhaus; Erwin Möschter, Neunkirchen, and Richard Weiss, Troisdorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Aug. 31, 1981, Ser. No. 297,564

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1980, 3033264

Int. Cl.³ D04H *1/08;* B32B *15/00, 17/10*

U.S. Cl. 428—280 10 Claims



1. A thermoplastic resin impregnated substrate which comprises a porous textile substrate in the form of a carrier sheet and a gelled thermoplastic resin unilaterally penetrating through said sheet and being free of air bubbles; said carrier sheet being impregnated only from one side with an evacuated thermoplastic resin paste comprised of a vinyl chloride polymer having a viscosity between 1,000 and 10,000 cp while effecting complete displacement of air through the paste and

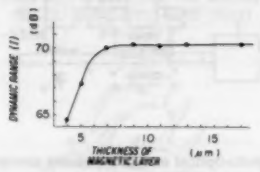
through the other side of the carrier sheet and the impregnated carrier sheet, then being heated to effect gellation of said thermoplastic resin.

4,464,433

MAGNETIC RECORDING MEDIUM

Kenji Hirabayashi, and Hitoshi Azegami, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1982, Ser. No. 357,300
Claims priority, application Japan, Mar. 26, 1981, 56-44433
Int. Cl.³ B32B *15/00*; B05D *5/12*
U.S. Cl. 428—336 **2 Claims**



1. A magnetic recording medium which has a dynamic range (I) of 70 dB or more and dynamic range (II) of 45 dB or more wherein said dynamic range (I) is given as a difference between an output at 3% input level of third harmonic wave output at a wavelength of 237.5 μm in the optimum bias recording via head having a recorded width of 1 to 1.1 mm based on an output of the original signal and a reproduced output calibrated by auditory sense calibration at non-signal recording in the bias and said dynamic range (II) is given as a difference between a saturated output at a wavelength of 4.75 μm under the same condition and the reproduced output calibrated by the A-curve calibration at non-signal recording in the bias, wherein said recording medium is comprised of a substrate and a magnetic layer coated thereon, said magnetic layer being comprised of metallic iron powder having a coercive force of at least 700 Oe, a square ratio of 0.80–0.84 and an orientation of 2.0–2.3, said magnetic layer having a thickness greater than 5 μm.

4,464,434

MICROENCAPSULATED ALKALOIDAL MATERIAL AND METHOD OF PRODUCING SAME

Danny A. Davis, Casstown, Ohio, assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 885,914
Int. Cl.³ B01J *13/02*; A01N *25/28*
U.S. Cl. 428—402.22 **42 Claims**

1. An alkaloid-containing microcapsule which comprises a core material carrying an alkaloidal material and a wall of a cross-linked, film-forming, water-impermeable polymeric material surrounding said core material wherein said core material includes a physiologically acceptable acid capable of forming an acid addition salt of the alkaloidal material, said capsule core material including an amount of said acid in excess of the stoichiometric amount necessary to form the acid addition salt, the alkaloidal material being in the form of a water-soluble acid addition salt of said acid.

27. A method of producing alkaloidal material-containing microcapsules which comprises:

(1) intermixing, inter alia, (a) a film-forming, water-impermeable polymeric wall material, (b) a water-immiscible liquid vehicle capable of dissolving the polymeric wall material, and (c) an aqueous vehicle carrying an acid addition salt of a tobacco alkaloid and a physiologically acceptable acid, said acid addition salt being substantially insoluble in said liquid vehicle, said capsule core material including an amount of said acid in excess of the stoichiometric amount necessary to form said acid addition salt, said aqueous vehicle being capable of dispersion in said liquid vehicle as a plurality of individual, minute core material entities;

(2) agitating the produced admixture to disperse the alkaloidal material-carrying aqueous vehicle as individual, minute core material entities throughout the liquid vehicle having said polymeric wall material dissolved therein to form an agitated system in which the liquid vehicle constitutes a continuous phase;

(3) inducing phase separation within said agitated system to separate said polymeric wall material from said continuous phase and thereby forming sheaths of said polymeric wall material about said core material entities containing said alkaloidal material; and

(4) cross-linking said polymeric wall material in the sheaths to form protective walls around said core material entities.

4,464,435

POLYACETAL RESIN COMPOSITION EXCELLENT IN HEAT STABILITY AND SURFACE PROCESSABILITY AND PROCESS FOR SURFACE TREATING SAME

Yoshihiro Hattori, Kawasaki; Takashi Watanabe, Ayase, and Kunio Maeda, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 86,534, Oct. 19, 1979, abandoned. This application Apr. 7, 1981, Ser. No. 251,936
Claims priority, application Japan, Oct. 25, 1978, 53-130479; Aug. 17, 1979, 54-104102; Apr. 14, 1980, 55-48005
Int. Cl.³ B32B *15/08, 27/06, 27/24*
U.S. Cl. 428—409 **34 Claims**

1. A surface-treated polyacetal resin product having no surface cracks noticeable to the naked eye and having surface characteristics such that when chemical nickel is deposited thereon by immersing the product in an aqueous chemical nickel solution at 40° C. for 10 minutes to deposit chemical nickel on the surface thereof, eluting the deposited chemical nickel from said surface, and determining the amount of chemical nickel eluted, the nickel weight obtained by dividing the area of the surface deposited with nickel to give the amount of chemical nickel deposited is 85–150 mg/dm^2 and wherein the peeling strength of a plated metal layer plated by chemically plating a nickel layer by means of a chemical nickel solution, then electroplating with copper so as to give a mean plating thickness of about 40μ, drawing at least two parallel breaking lines or nicks on the plated metal surface at a distance of 10 mm apart, pulling or stretching the plated metal layer between said lines or nicks in a direction perpendicular to said surface and measuring the stress necessary for peeling is 1.0 kg/cm or more; said surface-treated polyacetal resin product being obtained by a process comprising (1) blending (a) about 100 parts by weight of polyacetal resin, (b) about 2 to about 35 parts by weight of a carbonate, phosphate or acetate of a metal belonging to Group II of the Periodic Table or a mixture thereof and (c) about 0.01 to about 20 parts by weight of a polymer, a copolymer or a mixture thereof of a compound selected from the group consisting of unsaturated polyesters, alkyl esters of acrylic acid or methacrylic acid, amides of acrylic acid or methacrylic acid, triallyl cyanurate, diallyl phthalate, vinyl acetate and divinylbenzene; (2) molding the resulting polyacetal resin composition into the desired configuration; and (3) conditioning the resulting molded product by dipping said molded product in an aqueous solution consisting essentially of sulfuric acid.

12. A surface-treated polyacetal resin product having no surface cracks noticeable to the naked eye and having surface characteristics such that when chemical nickel is deposited thereon by immersing the product in an aqueous chemical nickel solution at 40° C. for 10 minutes to deposit chemical nickel on the surface thereof, eluting the deposited chemical nickel from said surface, and determining the amount of chemical nickel eluted, the nickel weight obtained by dividing the area of the surface deposited with nickel to give the amount of chemical nickel deposited is 85–150 mg/dm^2 and wherein the peeling strength of a plated metal layer plated by chemically

plating a nickel layer by means of a chemical nickel solution, then electroplating with copper so as to give a mean plating thickness of about 40μ, drawing at least two parallel breaking lines or nicks in a direction perpendicular to said surface and measuring the stress necessary for peeling is 1.0 kg/cm or more; said surface-treated polyacetal resin product being obtained by a process comprising (1) blending (a) about 100 parts by weight of polyacetal resin, (b) about 2 to about 35 parts by weight of a carbonate, phosphate or acetate of a metal belonging to Group II of the Periodic Table or a mixture thereof and (c) about 0.01 to about 20 parts by weight of a polymer, a copolymer or a mixture thereof of a compound selected from the group consisting of unsaturated polyesters, alkyl esters of acrylic acid or methacrylic acid, amides of acrylic acid or methacrylic acid, triallyl cyanurate, diallyl phthalate, vinyl acetate and divinylbenzene; (2) molding the resulting polyacetal resin composition into the desired configuration; and (3) conditioning the resulting molded product by dipping said molded product in an aqueous solution containing sulfuric acid but not more than about 4% by weight of potassium bichromate.

20. A surface-treated polyacetal resin product having no surface cracks noticeable to the naked eye and having surface characteristics such that when chemical nickel is deposited thereon by immersing the product in an aqueous chemical nickel solution at 40° C. for 10 minutes to deposit chemical nickel on the surface thereof, eluting the deposited chemical nickel from said surface, and determining the amount of chemical nickel eluted, the nickel weight obtained by dividing the area of the surface deposited with nickel to give the amount of chemical nickel deposited is 85–150 mg/dm^2 and wherein the peeling strength of a plated metal layer plated by chemically plating a nickel layer by means of a chemical nickel solution, then electroplating with copper so as to give a mean plating thickness of about 40μ, drawing at least two parallel breaking lines or nicks on the plated metal surface at a distance of 10 mm apart, pulling or stretching the plated metal layer between said lines or nicks in a direction perpendicular to said surface and measuring the stress necessary for peeling is 1.0 kg/cm or more; said surface-treated polyacetal resin product being obtained by a process comprising (1) blending (a) about 100 parts by weight of polyacetal resin, (b) about 2 to about 35 parts by weight of a carbonate, phosphate or acetate of a metal belonging to Group II of the Periodic Table or a mixture thereof and (c) about 0.01 to about 20 parts by weight of a polymer, a copolymer or a mixture thereof of a compound selected from the group consisting of unsaturated polyesters, alkyl esters of acrylic acid or methacrylic acid, amides of acrylic acid or methacrylic acid, triallyl cyanurate, diallyl phthalate, vinyl acetate and divinylbenzene; (2) molding the resulting polyacetal resin composition into the desired configuration; and (3) conditioning the resulting molded product by dipping said molded product in an aqueous solution consisting essentially of sulfuric acid and phosphoric acid.

4,464,436

CHROMIC ACID-IONIC ETHYLENICALLY UNSATURATED COMPLEXES AND POLYMERS CONTAINING THE SAME

Edward J. Murphy, Mt. Prospect, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Dec. 28, 1981, Ser. No. 334,919
Int. Cl.^{3} C08F *30/04, 2/50*; B32B *15/08*
U.S. Cl. 428—463 **15 Claims**

1. An unsaturated ionic complex of chromic acid with monoethylenically unsaturated monomer containing a single amine group.

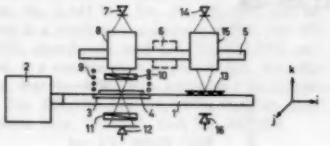
15. A metal substrate coated with polyethylenically unsaturated material cured by addition polymerization in the presence of the complex of claim 1.

4,464,437

MAGNETO-OPTICAL MEMORY ELEMENT

Marlies Urner Wille, Hamburg, and Peter Hansen, Appen, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 24, 1980, Ser. No. 132,747
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1979, 2911992
Int. Cl.^{3} G11C *13/06*
U.S. Cl. 428—458 **7 Claims**



1. A magneto-optical memory element comprising:
a nonmagnetizable substrate; and
an amorphous layer provided on the substrate, said layer comprising an alloy of a rare-earth metal and a transition metal, said alloy having a uniaxial magnetic anisotropy;
characterized in that the alloy comprises at least one atomic percent bismuth, and the alloy has a composition defined by the formula

$$(R_{1-x}M_x)_{1-y}Bi_y$$

where R is at least one rare-earth metal, M is at least one transition metal, and $0.6 \leqq x \leqq 0.9$.

4,464,438

BLENDS OF POLYVINYL ALCOHOL AND ETHYLENE-VINYL ALCOHOL COPOLYMER AS GREASE RESISTANT MELT EXTRUDABLE FILMS

Pang-Chia Lu, Belle Mead, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 2, 1983, Ser. No. 490,915
Int. Cl.^{3} B32B *27/08*
U.S. Cl. 428—516 **12 Claims**

1. A composition suitable for melt extrusion into opaque films comprising an intimate blend of:
(A) 20–60 weight percent of polyvinyl alcohol;
(B) 30–70 weight percent of an ethylene-vinyl alcohol copolymer containing 28 to 70 mole percent of ethylene; and
(C) 5–20 weight percent of an agent to aid melt processing of the mixture selected from the group consisting of polyamides, polyurethanes and polyoxazoline polymers.

4,464,439

CO-EXTRUDED LAMINATE CONSISTING OF AT LEAST ONE SHEET OF POLYPROPYLENE AND AT LEAST ONE SHEET OF POLYMERIC MATERIAL BASED ON HIGH-IMPACT POLYSTYRENE

Jean Castelein, Mellery, Belgium, assignor to Montefina S.A., Belgium

Filed Mar. 10, 1982, Ser. No. 356,658
Claims priority, application Italy, Mar. 12, 1981, 20313 A/81
Int. Cl.^{3} B32B *27/08*
U.S. Cl. 428—517 **4 Claims**

1. A thermoplastic laminate, suitable for thermo-forming, of a composite structure consisting of at least one sheet of crystalline polypropylene and of at least one sheet of polymeric material consisting of a mixture containing 45% to 55% by weight of high-impact polystyrene (HIPS), from 40% to 45% by weight of crystalline polypropylene and from 5% to 15% by weight of styrene/dienic monomer tri-block copolymer, in

which the dienic monomer is butadiene or isoprene, with a structure of at least 3 sequences and represented by the formula S—(D—S)$_n$ wherein n is an integer, S=styrene, D=butadiene or isoprene, having a content in styrene lower than 50% by weight, said laminate being obtained through the co-extrusion of the different polymeric materials constituting the single individual sheets and by the successive calandering together of the co-extruded sheets.

4,464,440

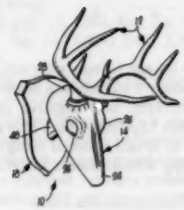
TROPHY MOUNT

John G. Dotzman, 8029 Meadow La., Leawood, Kans. 66206

Filed Apr. 4, 1983, Ser. No. 481,819

Int. Cl.³ B44C *5/02*; G09F *19/00*

U.S. Cl. 428—542.4 **6 Claims**



1. A trophy mount for displaying a pair of separate animal horns, antlers, or the like, comprising:

structure defining a simulated skull configured to resemble a portion of the head of said animal;

a pair of laterally spaced, horn-securing regions located on said structure in a substantially symmetrical manner;

means for mounting said separate animal horns respectively to a corresponding horn-securing region; and

panel means for supporting said simulated skull structure.

4,464,441

MOLYBDENUM COATED WITH A NOBLE METAL

Wolfgang Pikorz; Hans Scheuermann, and Alois Sonntag, all of Warstein, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 21, 1981, Ser. No. 313,661

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1980, 3039658

Int. Cl.³ B32B *15/01*

U.S. Cl. 428—579 **3 Claims**

1. Molybdenum disc having a thickness of about 0.5 to several mm coated with a noble metal for use with a semiconductor, in which the noble metal is applied to the molybdenum in a layer thickness of 0.02μ, via an intermediate layer of chromium having a layer thickness of 0.5 to 10.0μ.

4,464,442

BRAZING ALLOY

Thomas J. McDonald, Sutton Coldfield, and Christopher Follows, Parkside, both of England, assignors to IMI Marston Limited, Wolverhampton, England

Continuation of Ser. No. 253,375, Apr. 13, 1981, abandoned. This application Jul. 13, 1983, Ser. No. 512,952

Claims priority, application United Kingdom, Apr. 29, 1980, 8014081

Int. Cl.³ B32B *15/01, 15/20*; C22C *21/04*

U.S. Cl. 428—654 **10 Claims**

1. A clad sheet of aluminum for use in the vacuum brazing of large section structures, the clad sheet having on at least one of its sides a brazing alloy consisting essentially of by weight silicon 4.5% to 13.5%, magnesium up to 3%, strontium 0.1% to 0.3%, balance aluminum apart from incidental impurities.

4,464,443

DRYING AGENT IN MULTI-LAYER POLYMERIC STRUCTURE

Christopher J. Farrell, Arlington Heights; Bob C. Tsai, Rolling Meadows, and James A. Wachtel, Buffalo Grove, all of Ill., assignors to American Can Company, Greenwich, Conn.

Continuation-in-part of Ser. No. 418,199, Sep. 15, 1982, Pat. No. 4,425,410, which is a continuation-in-part of Ser. No. 101,703, Dec. 10, 1979, Pat. No. 4,407,897. This application Oct. 3, 1983, Ser. No. 538,436

The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.

Int. Cl.³ B32B *9/00*

U.S. Cl. 428—688 **7 Claims**

1. In a multi-layer polymer structure having a layer of a moisture-sensitive oxygen barrier polymer and exterior layers of structural polymer, the improvement which comprises the incorporation of an ammonium chloride drying agent entrapped in the moisture-sensitive oxygen barrier layer.

4,464,444

FUEL CELL POWER GENERATION SYSTEM AND METHOD OF OPERATING THE SAME

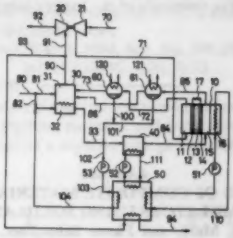
Hiroji Mikawa, Tohkai, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 29, 1982, Ser. No. 403,011

Claims priority, application Japan, Aug. 3, 1981, 56-120786

Int. Cl.³ H01M *8/04, 8/06*

U.S. Cl. 429—13 **7 Claims**



1. In a fuel cell power plant having fuel cells each of which has a cathode and an anode, a device which supplies air to the cathodes of the cells, and a device which produces hydrogen by a reaction between fuel and steam and which supplies the produced hydrogen to the anodes of the cells, combustion energy of an unreacted gas of the cells being afforded to the hydrogen producing device and the air supplying device; a fuel cell power plant characterized by comprising first means for condensing and re-vaporizing water contents contained in gases emitted from said cathodes and anodes and then supplying the steam to said hydrogen producing device, second means for temporarily accumulating heat generated by said fuel cells, and third means for using the heat accumulated by said second means, in order to vaporize the water in said first means.

4,464,445

BATTERY PACK CARTRIDGE

David M. Matti, 1933 Windward La., Hanover Park, Ill. 60103

Filed May 13, 1983, Ser. No. 494,405

Int. Cl.³ H01M *2/10*

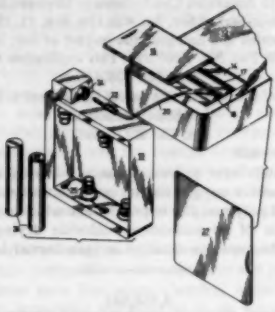
U.S. Cl. 429—99 **3 Claims**

1. A battery pack cartridge for electrical operation of an electronic device having a battery compartment located

therein containing positive and negative electrical connections to the electronic device comprising:

a casing member arranged to hold a battery having positive and negative terminals thereon;

an electrical connector having positive and negative terminals mounted to said casing for providing electrical connection to said positive and negative battery terminals;



a battery shaped insert having positive and negative electrical connectors arranged thereon for electrical connection to the positive and negative electrical connections of the electronic device;

a flexible electrical wire arranged to provide remote separable electrical interconnection between said positive and negative electrical connector terminals and the positive and negative terminals of the battery insert.

4,464,446

ANODES OF COMPOSITE MATERIALS AND ACCUMULATORS USING SOLID ANODES

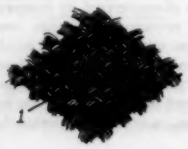
Michel Berger, Meze, and Pierre Schaeffner, St-Medard-en-Jalles, both of France, assignors to Societe Civile Des Composites Electrolytiques, Paris, France

Filed Jun. 2, 1983, Ser. No. 500,326

Claims priority, application France, Jun. 11, 1982, 82 10257; Oct. 22, 1982, 82 17736

Int. Cl.³ H01M *6/14*

U.S. Cl. 429—190 **7 Claims**



1. Anodes of a composite material, formed on a support constituted by fibrils, said fibrils being coated with a conducting layer of copper of thickness comprised between 3 and 10 microns, said copper layer being covered with a layer of cadmium of thickness comprised between 3 and 6 microns and said cadmium layer being covered with a layer of zinc of thickness greater than about 20 microns.

4,464,447

RECHARGEABLE LITHIUM BATTERIES WITH NON-METAL ELECTRODES

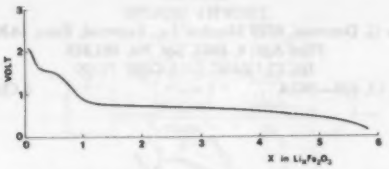
Mario Lazzari, Pavia, and Bruno Scrosati, Rome, both of Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Continuation-in-part of Ser. No. 178,775, Aug. 18, 1980, abandoned. This application Jan. 6, 1982, Ser. No. 337,381

Claims priority, application Italy, May 13, 1980, 22004 A/80

Int. Cl.³ H01M *4/40*

U.S. Cl. 429—194 **6 Claims**



1. A rechargeable lithium battery with non-metal electrodes which comprises a positive electrode, a negative electrode and a non-aqueous electrolyte, said negative electrode being a material of the formula $Li_xM_2O_3$ where M is a transition metal and x ranges from 1 to 6, said material being obtained by electrochemically reacting with lithium a metal oxide of the formula M_2O_3.

4,464,448

METHOD OF PRODUCING AN IDENTITY DOCUMENT

Rolf E. Rothfjell, Kalix, Sweden, assignor to AB Rollfilm, Stockholm, Sweden

Continuation-in-part of Ser. No. 304,664, Sep. 22, 1981, abandoned. This application Jul. 5, 1983, Ser. No. 510,641

Claims priority, application Sweden, Oct. 1, 1980, 8006858

Int. Cl.³ G03C *7/16, 7/00*; G09F *3/02*

U.S. Cl. 430—22 **5 Claims**

1. A method of producing an identity document comprising:

A. exposing a multicolor photographic paper surface to an image of a black and white object to be reproduced thereon;

B. exposing said multicolor photographic paper surface to a security pattern, the pattern being superimposed over at least a portion of the surface on which said image is to be reproduced and said pattern consisting of several colors; and

C. developing said multicolor photographic paper so that a composite photograph of said image and security pattern is obtained with the pattern being superimposed in several colors over at least a portion of said black and white image.

4,464,449

RECORDING METHOD HAVING UNIFORM EXPOSURE, CHARGING, AND INFRARED IMAGE EXPOSURE

Isamu Kajita, Yokohama, and Fumio Sumino, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 144,217, Apr. 28, 1980, abandoned. This application Jan. 29, 1982, Ser. No. 343,951

Claims priority, application Japan, May 4, 1979, 54-54887

Int. Cl.³ G03G *13/22*

U.S. Cl. 430—54 **2 Claims**

1. A recording method wherein information is recorded by projecting an infrared image radiation onto a recording medium having its principal sensitivity in the wavelength region of visible light, said method comprising the steps of uniformly exposing said recording medium to visible light; charging said recording medium after said visible light exposure step; and, while hysteresis produced by the visible light exposure step still remains on said recording medium, projecting an infrared

radiation onto said recording medium, wherein said infrared radiation includes the information to be recorded.

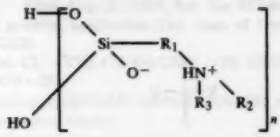
4,464,450

MULTI-LAYER PHOTORECEPTOR CONTAINING SILOXANE ON A METAL OXIDE LAYER

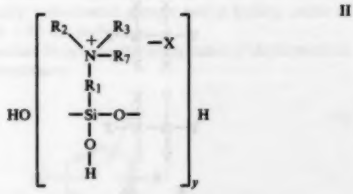
Leon A. Teuscher, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 21, 1982, Ser. No. 420,962
Int. Cl.³ G03G 5/00, 5/04
U.S. Cl. 430—59 20 Claims

1. A process for preparing an electrostatographic imaging member capable of accepting a negative electrostatic charge, said member having an imaging surface and comprising at least two electrically operative layers comprising a charge transport layer and a contiguous charge generating layer overlying a film comprising a siloxane reaction product of a hydrolyzed silane having reactive OH and ammonium groups attached to silicon atoms of said siloxane, said film being contiguous to a metal oxide layer of a conductive metal anode layer, said conductive anode layer being on one side of said two electrically operative layers and said imaging surface being on the opposite side of said two electrically operative layers, comprising providing a hydrolyzed silane having the general formula selected from the group consisting of:



I



II

and mixtures thereof, wherein R_1 is an alkylidene group containing 1 to 20 carbon atoms, R_2 and R_3 are independently selected from the group consisting of H, a lower alkyl group containing 1 to 3 carbon atoms, a phenyl group and a poly-(ethylene-amino) group, R_7 is selected from the group consisting of H, a lower alkyl group containing 1 to 3 carbon atoms and a phenyl group, X is an anion from an acid or acidic salt, n is 1, 2 3 or 4, and y is 1, 2, 3 or 4 in sufficient water to form an aqueous solution while maintaining said aqueous solution at a pH between about 4 and about 10 with an acidic composition selected from the group consisting of an acid, acidic salt and mixtures thereof, contacting said metal oxide layer of said conductive anode layer with said aqueous solution to form a coating, drying said coating to form a film of said siloxane reaction product on said metal oxide layer, and applying said two electrically operative layers to said film.

4,464,451

ELECTROPHOTOGRAPHIC IMAGE-FORMING MEMBER HAVING ALUMINUM OXIDE LAYER ON A SUBSTRATE

Shigeru Shirai, Yamato; Junichiro Kanbe, and Tadaji Fukuda, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1982, Ser. No. 344,056
Claims priority, application Japan, Feb. 6, 1981, 56/16410; Feb. 6, 1981, 56/16412; Feb. 16, 1981, 56/16411; Apr. 23, 1981, 56/62065; Apr. 23, 1981, 56/62066; Apr. 23, 1981, 56/62068; Apr. 24, 1981, 56/62178; Apr. 24, 1981, 56/62179; Apr. 24, 1981, 56/62180
The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.
Int. Cl.³ G03G 5/082
U.S. Cl. 430—65 167 Claims

1. An electrophotographic image-forming member, comprising a substrate for electrophotography and an amorphous layer which is laid on said substrate and comprising silicon atoms as matrix and at least one of hydrogen atom and halogen atom and exhibits photoconductivity, said substrate comprising aluminum oxide containing chemi-structurally water at least on the surface thereof, and said amorphous layer having a layer region containing at least one atom selected from the group consisting of oxygen atom, nitrogen atom and carbon atom in at least a part thereof, the content of said atom in said layer region being distributed unevenly in the direction of the thickness of said layer.

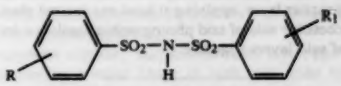
4,464,452

DEVELOPER COMPOSITIONS CONTAINING DIARYL SULFONIMIDES

Robert J. Gruber, Pittsford; Paul C. Julien, Webster, and Raymond A. Yourd, III, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 2, 1983, Ser. No. 490,264
Int. Cl.³ G03G 9/08, 9/10
U.S. Cl. 430—110 31 Claims

1. A dry negatively charged toner composition comprised of resin particles, pigment particles, and from about 0.1 to about 10 weight percent of a negative charge enhancing additive, of the formula



wherein R and R_1 are independently selected from the group consisting of alkyl, halogen, nitro, and hydrogen.

4,464,453

DRY TRANSFER CARRIER SHEETS FOR USE IN AN ELECTROPHOTOGRAPHIC PROCESS

Sidney Cooper, Rosyln Harbor, and Ezekiel J. Jacob, Brooklyn, both of N.Y., assignors to Ani-Live Film Services, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 112,827, Jan. 16, 1980, Pat. No. 4,370,400, which is a division of Ser. No. 799,476, May 23, 1977, Pat. No. 4,216,283. This application Dec. 20, 1982, Ser. No. 439,811
Int. Cl.³ G03G 13/16
U.S. Cl. 430—126 7 Claims

1. A carrier sheet used in an electrophotographic process which process comprises formation of an electrostatic image by electrophotographic means upon a carrier sheet, corresponding to information to be recorded, formation of a pattern of a toner composition on said carrier sheet corresponding to said electrostatic image thereby forming a toner-image, said carrier sheet being abhesive toward said toner image, and

wherein the toner-image is sprayed with an adhesive coating, so that when the adhesive-coated, toner-image is contacted with a receptor surface, the toner-image releases from the carrier sheet and adheres to the receptor surface.

4,464,454

METHOD FOR PRODUCING AN INFORMATION CARRIER IN THE FORM OF A CARD AND AN INFORMATION CARRIER PRODUCED IN ACCORDANCE WITH THE METHOD

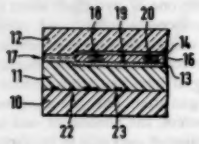
Werner Vogt, Schlieren, Switzerland, assignor to Interlock Sicherheitssysteme, Schlieren, Switzerland

Filed Jul. 20, 1982, Ser. No. 399,949

Claims priority, application Switzerland, Jul. 20, 1981, 4753/81

Int. Cl.³ G03C *1/90, 11/12;* B42D *15/00*

U.S. Cl. 430—256 **8 Claims**



1. A method for producing an information carrier in the form of a card having a multiplicity of plastic layers bonded together into a block, at least one of said layers being capable of carrying multiple types of information data, comprising the steps of applying a photographic emulsion to the surface of an auxiliary carrier to obtain a composite film bond having an adhesive strength sufficient to assure the performance of a photographic exposure, developing, fixing and drying said film bond, photographically exposing said film bond comprising said auxiliary carrier and said photographic emulsion to data provided for said card which is to be produced, photographically processing said film bond, securing said film bond with the free surface of said emulsion to a first plastic carrier layer by means of a compound having high adhesive strength, removing said auxiliary carrier from said emulsion remaining on said first carrier layer, applying at least one second plastic layer to the accessible side of said photographic emulsion, and bonding all of said layers together.

4,464,455

DRY-DEVELOPING NEGATIVE RESIST COMPOSITION

Yasuhiro Yoneda, Machida; Kenroh Kitamura, Fujisawa; Jiro Naito, Kanagawa, and Toshisuke Kitakohji, Machida, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

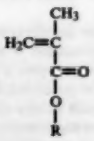
Filed Jun. 7, 1982, Ser. No. 385,887

Claims priority, application Japan, Jun. 9, 1981, 56-87568

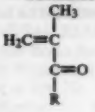
Int. Cl.³ G03C *5/16*

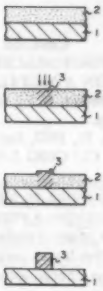
U.S. Cl. 430—270 **15 Claims**

1. A dry-developing negative resist composition consisting of (a) a polymer of a monomer of the following formula I or II or a copolymer of a monomer of the following formula I with a monomer of the following formula II,


I

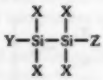
-continued

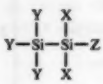

II

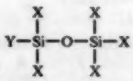


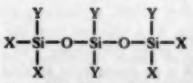
in which R represents an alkyl of 1 to 6 carbon atoms, benzyl, phenyl, or cyclohexyl and (b) 1% to 70% by weight, based on the weight of the composition, of at least one silicon compound, wherein the silicon compound is selected from the group consisting of the compounds of the formulae III, IV, V, VI, and VII,

III


IV


V


VI


VII

in which each X represents methyl, phenyl, biphenyl, phenylamino, phenoxy, benzyl, cyano, vinyl or acetoxy, each Y represents hydrogen, hydroxy, azido, vinyl, methoxy, ethoxy, butoxy, phenoxy, halogen, benzyl, phenyl, methyl, t-butyl biphenyl or acetoxy, and each Z represents phenyl, hydroxy, vinyl, methoxy, ethoxy, butoxy, benzyl, methyl, t-butyl, phenoxy, halogen, biphenyl, acetoxy or 1,4-bis(hydroxydimethylsilyl)benzene.

4,464,456

PHOTOSENSITIVE POLYMER COMPOSITIONS COMPRISING POLYETHER-ESTER AMIDES

Junichi Fujikawa, Kyoto; Hiroshi Mataki, Otsu; Chiaki Tanaka, Chita, and Shinobu Nakashima, Nagoya, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jan. 3, 1983, Ser. No. 455,308
Claims priority, application Japan, Jan. 6, 1982, 57-669
Int. Cl.³ G03C 1/68
U.S. Cl. 430—281 8 Claims

1. A photosensitive polymer composition comprising:

a. 100 parts by weight of polyether-ester amide comprising (a) at least one compound selected from the group consisting of aminocarboxylic acids having 6 to 15 carbon atoms, lactams having 6 to 15 carbon atoms and nylon mn salts wherein $10 \leqq m+n \leqq 30$, (b) at least one poly(alkylene oxide) glycol having a number average molecular weight of 200 to 6000, and (c) at least one dicarboxylic acid having 4 to 20 carbon atoms;

b. 10 to 200 parts by weight of at least one photopolymerizable vinyl monomer having a terminal ethylenically unsaturated bond and having a boiling point of at least 150° C.; and

c. 0.01% to 10% by weight, based on the total weight of the composition, of a photosensitizer.

4,464,457

10-PHENYL-1,3,9-TRIAZAANTHRACENES AND PHOTOPOLYMERIZABLE MIXTURE CONTAINING SAME

Dieter Bosse, Hofheim; Rainer Wingen, Frankfurt; Klaus Horn, Hofheim, and Walter Lutz, Mainz-Kastel, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 29, 1983, Ser. No. 527,466
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1982, 3232620
Int. Cl.³ C07D 471/04; C08F 2/46; G03C 1/70
U.S. Cl. 430—288 18 Claims

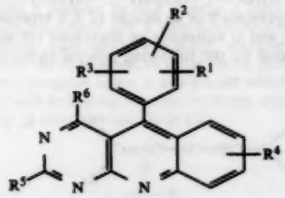
1. A photopolymerizable mixture consisting essentially of:

(a) a polymeric binder,

(b) a polymerizable compound having at least two terminal ethylenically unsaturated groups and a boiling point of more than 100° C., and

(c) a polynuclear N-hetercyclic compound of the formula A as a photoinitiator

(A)



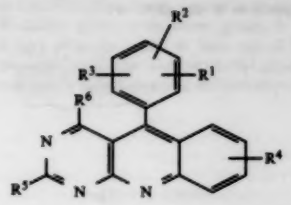
wherein

R^1, R^2 and R^3 are identical or different and each denotes a hydrogen or halogen atom, an alkyl or alkoxy group or a condensed aromatic radical,

R^4 is a hydrogen or halogen atom, an alkyl, alkoxy, halogenoalkyl, alkylcarbonyl, alkoxycarbonyl or dialkylamino group or a condensed aromatic radical, and

R^5 and R^6 are identical or different and denote hydroxy, alkoxy or dialkylamino groups.

12. A compound of the formula



wherein

R^1, R^2 and R^3 are identical or different and each denotes a hydrogen or halogen atom, an alkyl or alkoxy group or a condensed aromatic radical,

R^4 is a hydrogen or halogen atom, an alkyl, alkoxy, halogenoalkyl, alkylcarbonyl, alkoxycarbonyl or dialkylamino group or a condensed aromatic radical, and

R^5 and R^6 are identical or different and denote hydroxy, alkoxy or dialkylamino groups.

4,464,458

PROCESS FOR FORMING RESIST MASKS UTILIZING O-QUINONE DIAZIDE AND PYRENE

Ming-Fea Chow, Poughquag, N.Y.; Edward C. Fredericks, Haymarket, Va., and Wayne M. Moreau, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,766
Int. Cl.³ G03F 7/26
U.S. Cl. 430—312 5 Claims

1. A process for forming a positive resist mask on a substrate comprising:

A. forming on said substrate a first layer of essentially a novolak and o-quinonediazide containing positive resist which has been blanket exposed to substantially desensitize it;

B. blanket coating said first layer with a non-exposed second layer of a novolak and o-quinonediazide resist containing pyrene which comprises from about 1 to about 10 wt. % of said second resist layer;

C. imagewise exposing said second resist layer; and

D. developing a relief image in both said resist layers by removal thereof under said image-exposed portions.

4,464,459

METHOD OF FORMING A PATTERN OF METAL ELEMENTS

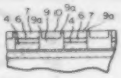
Teiji Majima, Komae, and Kiyoshi Ozaki, Suzaka, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

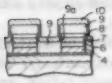
Filed Jun. 25, 1982, Ser. No. 392,173
Claims priority, application Japan, Jun. 26, 1981, 56-98371
Int. Cl.³ H01L 21/18
U.S. Cl. 430—313 8 Claims

1. A method of forming a pattern of metal elements on a substrate of a magnetic bubble memory or semiconductor device, comprising the steps of:

forming a pattern forming layer on said substrate, said pattern forming layer having (i) portions of metal positioned in a plane substantially parallel to the plane of the substrate and spaced apart by a gap of less than 1 μm from which said pattern of metal elements is formed and (ii)

portions of insulating materials interposed between said metal portions in said gaps; and





processing said pattern forming layer by using photolithographic techniques to form said pattern therefrom.

4,464,460

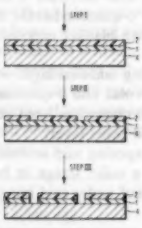
PROCESS FOR MAKING AN IMAGED OXYGEN-REACTIVE ION ETCH BARRIER

Hiroyuki Hiraoka, Saratoga; Donald C. Hofer, Morgan Hill; Robert D. Miller, San Jose; Lester A. Pederson, San Jose, and Carlton G. Willson, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1983, Ser. No. 508,644

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—323 **8 Claims**



1. A process for making an imaged oxygen-reactive ion etch barrier, said process being characterized by the steps of

(1) coating a substrate with a polymer layer;

(2) dissolving a polysilane having a molecular weight ($\overline{M}w$) above 4,000 and a glass transition temperature above 100° C. in an organic solvent in which said polymer layer is insoluble;

(3) coating said dissolved polysilane as a film on the polymer coated substrate;

(4) exposing said polysilane film in an imagewise manner to radiation;

(5) developing the polysilane film by contacting it with a solvent to dissolve the areas which have been exposed to radiation and thereby uncover portions of the polymer layer; and

(6) exposing the system to anisotropic oxygen-reactive ion etching to uncover portions of the substrate and thereby generate a high resolution, high aspect ratio relief structure.

4,464,461

DEVELOPMENT OF LIGHT-SENSITIVE QUINONE DIAZIDE COMPOSITIONS

John R. Guild, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 22, 1983, Ser. No. 516,227

Int. Cl.³ G03C *5/34*

U.S. Cl. 430—326 **30 Claims**

1. A developing composition for use in developing an imagewise-exposed layer of a light-sensitive quinone diazide composition, said developing composition comprising a quaternary alkanol ammonium hydroxide developing agent and a stabilizing concentration of a semicarbazide.

10. In a process for forming a resist image which comprises developing an imagewise-exposed layer of a light-sensitive quinone diazide composition with an alkaline developing composition, the improvement wherein said alkaline developing composition comprises a quaternary alkanol ammonium hydroxide developing agent and a stabilizing concentration of a semicarbazide.

4,464,462

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Naohiko Sugimoto; Tetsuro Kojima, and Yasuo Mukunoki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

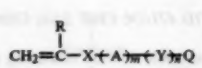
Filed Jul. 29, 1983, Ser. No. 518,721

Claims priority, application Japan, Jul. 30, 1982, 57-133371

Int. Cl.³ G03C *1/84*

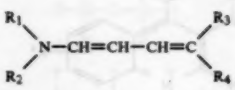
U.S. Cl. 430—512 **32 Claims**

1. A silver halide photograhic light-sensitive material material comprising a support having thereon at least one light-sensitive silver halide emulsion layer and at least one light-insensitive layer, the photographic light-sensitive material containing (A) an ultraviolet ray absorbing polymer latex which comprises a polymer or a copolymer having a repeating unit derived from a monomer represented by the following general formula (I):



(I)

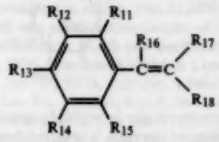
wherein R represents a hydrogen atom, a lower alkyl group having from 1 to 4 carbon atoms or a chlorine atom; X represents —CONH—, —COO— or a phenylene group; A represents a linking group selected from an alkylene group having from 1 to 20 carbon atoms or an arylene group having from 6 to 20 carbon atoms; Y represents —COO—, —OCO—, —CONH—, —NHCO—, —SO_2NH—, —NHSO_2—, —SO_2— or —O—; m represents 0 or an integer of 1; n represents 0 or an integer of 1; and Q represents an ultraviolet ray absorbing group represented by the following general formula (II) or (III):



(II)

wherein R_1 and R_2, which may be the same or different, each represents a hydrogen atom, an alkyl group having from 1 to 20 carbon atoms or an aryl group having from 6 to 20 carbon atoms, provided that the both of R_1 and R_2 do not simultaneously represent hydrogen atoms, and further R_1 and R_2 may combine to form an atomic group necessary to form a cyclic amino group; R_3 represents a cyano group, —$COOR_5$, —$CONHR_5$, —COR_5 or —SO_2R_5; and R_4 represents a cyano group, —$COOR_6$, —$CONHR_6$, —COR_6 or —SO_2R_6; wherein R_5 and R_6 each represents an alkyl group having from 1 to 20 carbon atoms or an aryl group having from 6 to 20 carbon

atoms, and further R_5 and R_6 may combine to form an atomic group necessary to form a 1,3-dioxocyclohexane nucleus, a 1,3-diaza-2,4,6- trioxocyclohexane nucleus (a barbituric acid nucleus), a 1,2- diaza-3,5-dioxocyclopentane nucleus or a 2,4-diaza-1-alkoxy-3,5-dioxocyclohexene nucleus; and at least one of R_1, R_2, R_3 and R_4 bonds to the vinyl group through the linking group,



(III)

wherein R_{11}, R_{12}, R_{13}, R_{14} and R_{15} each represents a hydrogen atom, a halogen atom, an alkyl group having from 1 to 20 carbon atoms, an aryl group having from 6 to 20 carbon atoms, an alkoxy group having from 1 to 20 carbon atoms, an aryloxy group having from 6 to 20 carbon atoms, an alkylthio group having from 1 to 20 carbon atoms, an arylthio group having from 6 to 20 carbon atoms, an amino group, an alkylamino group having from 1 to 20 carbon atoms, an arylamino group having from 6 to 20 carbon atoms, a hydroxyl group, a cyano group, a nitro group, an acylamino group, a carbamoyl group, a sulfonyl group, a sulfamoyl group, a sulfonamido group, an acyloxy group or an oxycarbonyl group, and R_{11} and R_{12}, R_{12} and R_{13}, R_{13} and R_{14} or R_{14} and R_{15} may form a 5- or 6-membered ring by ring closure; R_{16} represents a hydrogen atom or an alkyl group having from 1 to 20 carbon atoms; R_{17} represents a cyano group, —$COOR_{19}$, —$CONHR_{19}$, —COR_{19} or —SO_2R_{19}; and R_{18} represents a cyano group, —$COOR_{20}$, —$CONHR_{20}$, —COR_{20} or —SO_2R_{20}; wherein R_{19} and R_{20} each represents an alkyl group having from 1 to 20 carbon atoms or an aryl having from 6 to 20 carbon atoms; wherein one of R_{11}, R_{12}, R_{13}, R_{14}, R_{15}, R_{16}, R_{17} and R_{18} bonds to the vinyl group through the linking group, and (B) a fluorine containing cationic surface active agent.

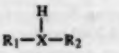
4,464,463

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

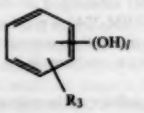
Tetsuro Kojima, and Hidetoshi Kobayashi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 26, 1983, Ser. No. 517,532
Claims priority, application Japan, Jul. 26, 1982, 57-129780
Int. Cl.³ G03C *1/84*
U.S. Cl. 430—512 **49 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon a light-sensitive silver halide emulsion layer and a light-insensitive layer, the color photographic light-sensitive material contains in a layer, selected from the light-sensitive silver halide emulsion layer and the light-insensitive layer, a compound which is capable of reacting with and fixing formaldehyde gas represented by the following general formula (I) or (II):

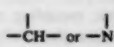


(I)

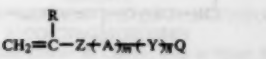


(II)

wherein R_1 and R_2, which may be the same or different, each represents an alkyl group having from 1 to 40 carbon atoms, an aryl group having from 6 to 40 carbon atoms, an acyl group having from 2 to 40 carbon atoms, an alkoxycarbonyl group having from 3 to 40 carbon atoms, a carbamoyl group having from 2 to 40 carbon atoms or an amino group, or R_1 and R_2 may form a ring or a dimer and at least one of R_1 and R_2 represents the acyl group, the alkoxycarbonyl group, the carbamoyl group or the amino group as defined above; X represents

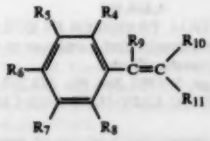


R_3 represents an alkyl group having from 1 to 20 carbon atoms or an aryl group having from 6 to 20 carbon atoms, or may be bonded to the benzene ring to form a dicyclic ring; and l represents an integer of not less than 2, wherein said compound which is capable of reacting with and fixing formaldehyde gas is loaded into an ultraviolet ray absorbing polymer latex which comprises a polymer or a copolymer having a repeating unit derived from a monomer represented by the following general formula (III):



(III)

wherein R represents a hydrogen atom, a lower alkyl group having from 1 to 4 carbon atoms or a chlorine atom; Z represents —CONH—, —COO— or a phenylene group; A represents a linking group selected from an alkylene group having from 1 to 20 carbon atoms and an arylene group having from 6 to 20 carbon atoms; Y represents —COO—, —OCO—, —CONH—, —NHCO—, —SO_2NH—, —NHSO_2—, —SO_2— or —O—; m represents 0 or an integer of 1; n represents 0 or an integer of 1; and Q represents an ultraviolet ray absorbing group represented by the following general formula (IV):



(IV)

wherein R_4, R_5, R_6, R_7 and R_8, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group having from 1 to 20 carbon atoms, an aryl group having from 6 to 20 carbon atoms, an alkoxy group having from 1 to 20 carbon atoms, an aryloxy group having from 6 to 20 carbon atoms, an alkylthio group having from 1 to 20 carbon atoms, an arylthio group having from 6 to 20 carbon atoms, an amino group, an alkylamino group having from 1 to 20 carbon atoms, an arylamino group having from 6 to 20 carbon atoms, a hydroxyl group, a cyano group, a nitro group, an acylamino group, a carbamoyl group, a sulfonyl group, a sulfamoyl group, a sulfonamido group, an acyloxy group or an oxycarbonyl group, and R_4 and R_5, R_5 and R_6, R_6 and R_7 or R_7 and R_8 may form a 5- to 6-membered ring by ring closure; R_9 represents a hydrogen atom, an alkyl group having from 1 to 20 carbon atoms or an aryl group having from 6 to 20 carbon atoms; R_{10} represents a cyano group, —$COOR_{12}$, —$CONHR_{12}$, —COR_{12} or —SO_2R_{12}; R_{11} represents a cyano group, —$COOR_{13}$, —$CONHR_{13}$, —COR_{13} or —SO_2R_{13}; R_{12} and R_{13} each represents an alkyl group having from 1 to 20 carbon atoms or an aryl group having from 6 to 20 carbon atoms; and at least one of R_4, R_5, R_6, R_7, R_8, R_9, R_{10} and R_{11} bonds to the vinyl group through the linking group.

4,464,464

COLOR PHOTOGRAPHIC RECORDING MATERIAL

Reinhart Matejec; Fritz Nittel, and Johannes Sobel, all of Leverkusen, Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 26, 1982, Ser. No. 401,837

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1981, 3130079

Int. Cl.[3] G03C 7/26

U.S. Cl. 430—546 5 Claims

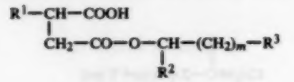
1. A color photographic recording material of increased color yield and reduced color granularity

comprising at least one silver halide emulsion layer,

a color coupler for chromogenic development associated with said silver halide layer,

and at least one internal layer comprising one or more hydrophobic color couplers and an oil former compound with the proviso that all color couplers in said internal layer are hydrophobic,

said oil former compound being of the following general formula



wherein

R^1 represents aliphatic group having at least 8 carbon atoms,

R^2 represents hydrogen or alkyl,

R^3 represents a heterocyclic group linked via a ring C-atom or via a ring N-atom, or a group of the formula $—(X-)_n—R^4$,

R^4 represents aryl,

X represents —O—, —NH—, $—NCH_3—$ or —CH=CH—,

m represents 0, 1 or 2 and

n represents 0 or 1.

4,464,465

CELL-DRIVEN VIRAL TRANSFER IN EUKARYOTES

Mark E. Lostrom, Redmond, Wash., assignor to Genetic Systems Corporation, Seattle, Wash.

Filed Apr. 5, 1982, Ser. No. 365,218

Int. Cl.[3] C12P 21/00; C12N 15/00, 5/00; C12R 1/91

U.S. Cl. 435—68 18 Claims

1. A method for immortalizing recipient immunoglobulin producing cells employing an EBV transformed cell as the transferring cell, said method comprising:

co-cultivating said transferring and said recipient cells in the substantial absence of functional T-cells, for sufficient incubation times and conditions to transfer EBV to said recipient cells to produce immortalized Ig producing cells which are EBNA-positive and which have a normal diploid number of chromosomes and cloning said immortalized Ig producing cells in the virtual absence of said transferring cells.

4,464,466

PROCESS OF PRODUCING LINCOMYCIN NUCLEOTIDES

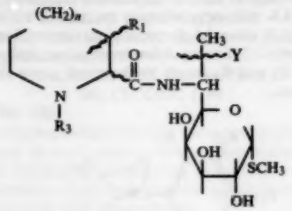
Alexander D. Argoudelis, and David W. Stroman, both of Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 255,542, Apr. 20, 1981, Pat. No. 4,383,109. This application Feb. 18, 1983, Ser. No. 467,976

Int. Cl.[3] C12P 19/32; C12R 1/465

U.S. Cl. 435—92 1 Claim

1. A process for preparing the 3-(5'-ribonucleotides) of a compound of the formula



wherein R_1, which can be singly or multiply substituted in the 3, 4, 5, 7, 8 or 9 position of the ring, is selected from the group consisting of hydrogen, alkyl and substituted alkyl wherein the alkyl portion is from 1 to 8 carbon atoms, inclusive, and isomeric forms thereof, cycloalkyl and substituted cycloalkyl, substituted oxygen, substituted nitrogen, halogen, phenyl, and substituted phenyl, $—(CH_2)_n—OH$, $—(CH_2)_n—NR_4R_5$, and isomeric forms thereof, wherein n is an integer of from 1 to 8, inclusive, R_4 and R_5 are H or alkyl of from 1 to 8 carbon atoms, inclusive, and isomeric forms thereof; wherein R_3 is selected from the group consisting of H, CH_3, C_2H_5, and $—CH_2—CH_2—OH$; wherein n is an integer of from 1 to 4, inclusive, wherein Y is selected from the group consisting of 7(S)-halo and 7(R)-halo; and the pharmaceutically acceptable salts thereof which comprises cultivating *Streptomyces rochei*, NRRL 3533, in an aqueous medium containing suitable nutrients, in the presence of a compound of the above formula, and recovering the desired 3-(5'-ribonucleotide) from the cultivated medium.

4,464,467

ANTITUMOR ANTIBIOTICS PRODUCED BY NEW STREPTOMYCES

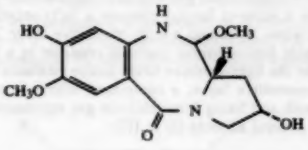
Masami Hatori, Yokosuka; Hiroaki Ohkuma, Tokyo; Masataka Konishi, Kawasaki; Takeo Miyaki, Yokohama, and Hiroshi Kawaguchi, Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Jul. 26, 1982, Ser. No. 401,469

Int. Cl.[3] C12P 17/18; C12N 1/20; C12R 1/465

U.S. Cl. 435—119 3 Claims

1. The process for the production of the antibiotic, BBM-2040A, having the formula



which comprises cultivating Streptomyces sp. Strain J576-99 (ATCC 39143) or a BBM-2040 producing mutant thereof in an aqueous nutrient medium containing assimilable sources of carbon and nitrogen under submerged aerobic conditions until a substantial amount of BBM-2040 is produced by said organism in said culture medium and then recovering the BBM-2040 antibiotic from the culture medium in its methanol adduct form.

3. A biologically pure culture of the microorganism Streptomyces sp. ATCC 39143, said culture being capable of producing the antibiotic BBM-2040 in a recoverable quantity upon cultivation in an aqueous nutrient medium containing assimilable sources of nitrogen and carbon.

4,464,468

IMMOBILIZATION OF ACTIVE PROTEIN BY CROSS-LINKING TO INACTIVE PROTEIN

Stratis Avrameas, La Celle Saint Cloud; Georges Broun, Rouen; Eric Selegny, Rouen, and Daniel Thomas, Rouen, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Continuation of Ser. No. 254,106, Apr. 14, 1981, abandoned, which is a continuation of Ser. No. 81,255, Oct. 2, 1979, abandoned, which is a continuation-in-part of Ser. No. 922,724, Jul. 7, 1978, abandoned, which is a continuation of Ser. No. 682,255, May 3, 1976, abandoned, which is a continuation of Ser. No. 541,257, Jan. 15, 1975, Pat. No. 4,004,979, which is a continuation of Ser. No. 286,233, Sep. 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 810,835, Mar. 26, 1969, abandoned. This application Apr. 16, 1982, Ser. No. 369,253

Claims priority, application France, Mar. 29, 1968, 68 146205; Jan. 24, 1969, 69 01451; Mar. 13, 1969, 69 07897

Int. Cl.³ C12N *11/02, 11/06;* C07G *7/00*

U.S. Cl. 435—177 34 Claims

1. A Self-supporting open-cell foam or sponge consisting essentially of a homogenous distribution of active protein and inactive protein cross-linked together with glutaraldehyde having the following properties:

(a) surface area—10^3 cm^2/cm^3 or, when dry, 1 m^2/g;

(b) specific gravity—0.1 when dry (including open cells);

(c) free volume—90 percent;

(d) open cell sizes—from 1 to 200 microns;

(e) capacity for water absorption—10 times its volume when starting with dry material;

(f) absorption capacity—30 percent when considering only the insoluble phase;

(g) elasticity (tension modulus)—0.4 to 0.7 kg/mm^2;

(h) compression—0.2 to 0.9 kg/mm^2, said active protein comprising up to 20 percent by weight of the total active and inactive proteins.

4,464,469

STABILIZED LACTASE SOLUTIONS AND PROCESSES FOR STABILIZATION

Stephen R. Parr, Selby, and Geoffrey M. Frost, Brayton, Selby, both of England, assignors to John & E. Sturge Limited, Selby, England

Filed Aug. 31, 1982, Ser. No. 413,461

Claims priority, application United Kingdom, Sep. 1, 1981, 8126457

Int. Cl.³ C12N *9/96, 9/38*

U.S. Cl. 435—188 7 Claims

1. An aqueous solution of a yeast lactase containing, as stabilizing agent, a stabilizing effective amount of sorbitol.

4,464,470

REPLICATION OF VIRULENT TREPONEMA PALLIDUM IN TISSUE CULTURE

A. Howard Fieldsteel, Cupertino; David L. Cox, East Palo Alto, and Randolph A. Moeckli, Mountain View, all of Calif., assignors to SRI International, Menlo Park, Calif.

Continuation-in-part of Ser. No. 237,917, Feb. 25, 1981, abandoned. This application Jan. 27, 1982, Ser. No. 343,353

Int. Cl.³ C12N *1/20, 5/00, 1/00, 1/36, 1/04*

U.S. Cl. 435—253 15 Claims

1. A method for the cultivation and replication of virulent *Treponema pallidum* which comprises (a) inoculating a tissue culture comprising mammalian cells and medium wherein said medium comprises a modified Eagle's MEM plus screened fetal bovine serum (FBS) to a final concentration of about 5% to about 30% and a dilution of about 1:30 of testis extract under a dissolved oxygen tension of about <0.3% to about 10% with a virulent strain of *Treponema pallidum,* and (b) culturing said inoculated medium for a time sufficient to allow replication.

4,464,471

BIOLOGICALLY ENGINEERED PLASMID CODING FOR PRODUCTION OF β-GLUCOSIDASE, ORGANISMS MODIFIED BY THIS PLASMID AND METHODS OF USE

Richard W. Armentrout, and Ronald D. Brown, both of Cincinnati, Ohio, assignors to University of Cincinnati, Cincinnati, Ohio

Filed Feb. 1, 1982, Ser. No. 344,298

Int. Cl.³ C12N *1/20, 15/00, 9/38, 9/42, 1/00, 9/00;* C12P *7/06, 7/10, 21/00;* C12R *1/185;* C07H *21/04*

U.S. Cl. 435—253 2 Claims

1. A recombination DNA plasmid comprising a cloning vector having covalently bound thereto a DNA insert coding for the production of beta-glucosidase wherein said DNA insert coding for the production of beta-glucosidase is isolated from *Escherichia adecarboxylata.*

2. *Escherichia coli* comprising a recombinant DNA cloning vector having covalently bound thereto a DNA insert coding for the production of beta-glucosidase, said DNA insert isolated from *Escherichia adecarboxylata.*

4,464,472

CONSTRUCTION AND USE OF FUNCTIONAL MINICHROMOSOMES

John A. Carbon, and Louise B. Clarke, both of Santa Barbara, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation of Ser. No. 185,453, Sep. 9, 1980, abandoned. This application Dec. 22, 1982, Ser. No. 452,275

Int. Cl.³ C12N *1/16;* C12P *21/00, 21/02, 19/34*

U.S. Cl. 435—255 3 Claims

3. A yeast host containing a DNA fragment derived from a yeast chromosome having centromere-like activity, having fewer than 10% of the base pairs of a yeast chromosome having the same DNA sequence and imparting mitotic stability joined to an ars gene.

4,464,473

ICE NUCLEATING MICROORGANISMS

Cindy S. Orser; Steven E. Lindow, both of Berkeley; Nickolas J. Panopoulos, Oakland, and Brian J. Staskawicz, Castro Valley, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Apr. 23, 1982, Ser. No. 371,162

Int. Cl.³ C12N *15/00, 1/20, 1/00;* C12P *21/00;* C07H *21/04*

U.S. Cl. 435—172.3 13 Claims

1. A bacterial cell having ice nucleation activity as a result of introducing into said cell or a parent of said cell a heterologous DNA sequence derived from Pseudomonas, Erwinia, or Xanthomonas microorganism encoding for ice nucleation activity or a heterologous DNA sequence encoding for ice nucleation activity and substantially homoduplexing with said DNA derived from said microorganism.

4,464,474

NON-A, NON-B HEPATITIS ASSAY AND VACCINE

Pierre L. J. Coursaget, Saint Avertin, and Philippe C. Maupas, Rochecorbon, both of France, assignors to Connaught Laboratories Limited, Willowdale, Canada

Filed Jul. 9, 1980, Ser. No. 167,282

Int. Cl.³ G01N *33/54, 33/56, 33/58*

U.S. Cl. 436—513 8 Claims

1. A method, which comprises assaying a sample suspected to contain NANB hepatatis virus antigens for an antigen of at least one of togavirus strains ATCC VR-2011, VR-2012, VR-2013 or VR-2014.

4,464,475

GLASS-CERAMIC ARTICLES CONTAINING OSUMILITE

George H. Beall, Big Flats; Agustin M. Chirino, Elmira; Kenneth Chyung, Painted Post; Francis W. Martin, and Mark P. Taylor, both of Painted Post, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 13, 1983, Ser. No. 457,652
Int. Cl.³ C03C 3/22
U.S. Cl. 501—9 5 Claims

1. A glass-ceramic body exhibiting high strength and a use temperature up to 1300° C. and higher, wherein Ba-osumulite constitutes the predominant crystal phase, consisting essentially, expressed in terms of weight percent on the oxide basis, of

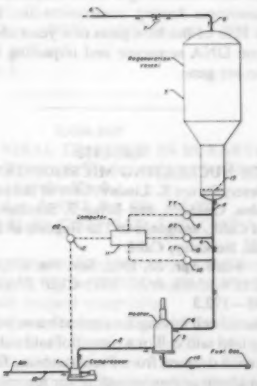
SiO_2	51–68
Al_2O_3	17.5–30
MgO	5–12
BaO	3.5–15
Si	0–1
Nb_2O_5	0–20
Ta_2O_5	0–10
TiO_2	0–12
ZrO_2	0–6

4,464,476

GAS INJECTION CONTROL

Victor A. Varady, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jun. 17, 1982, Ser. No. 389,518
Int. Cl.³ B01J 37/12
U.S. Cl. 502—6 10 Claims



1. A method for maintaining average pressure drop across gas discharge nozzles above a minimum value to prevent the possiblity of inactive nozzles, said nozzles comprising part of a distributor to which is supplied gas by means of a pipeline, said distributor used to distribute the gas about the lower portion of a processing vessel containing liquid or particulate matter, such method comprising the steps of:

(a) establishing a flow signal representative of the rate of flow of gas in said pipeline supplying the gas to said distributor;

(b) establishing a temperature signal representative of the temperature of the gas flowing in said distributor;

(c) establishing a pressure signal representative of the pressure of the gas flowing in said distributor;

(d) providing said flow, temperature, and pressure signals to a computing means;

(e) providing said computing means with the necessary equations and constant values;

(f) calculating in said computing means the average pressure drop across said nozzles;

(g) comparing said average pressure drop across said nozzles with said minimum value and generating a correction signal if said minimum value is larger; and,

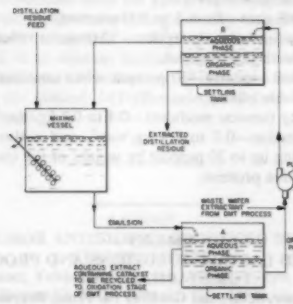
(h) transmitting said correction signal to adjustment means which are capable of increasing the average pressure drop across said nozzles and accomplishing said adjustments to prevent the occurrence of inactive nozzle.

4,464,477

PROCESS FOR THE RECOVERY AND REUSE OF HEAVY METAL OXIDATION CATALYST FROM RESIDUES IN THE WITTEN DMT PROCESS

Heinrich Bünger, Siegburg; Rudolf Cordes, and Gerhard Hoffmann, both of Niederkassel, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 326,280, Dec. 1, 1981, Pat. No. 3,372,875, which is a continuation of Ser. No. 156,605, Jun. 5, 1980, abandoned. This application Dec. 1, 1981, Ser. No. 326,175
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1980, 3045332
Int. Cl.³ B01J 31/40; C07C 69/82
U.S. Cl. 502—24 15 Claims



1. An extraction process for the recovery and reuse of heavy metal oxidation catalyst from the high-boiling distillation residue in the Witten process for producing dimethyl terephthalate, said high-boiling distillation residue being obtained in the oxidation of mixtures containing p-xylene and methyl p-toluene in the liquid phase with oxygen or an oxygen-containing gas under elevated pressure and at elevated temperature in the presence of dissolved heavy metal oxidation catalyst, subsequent esterification of the oxidation product with methanol under elevated pressure and at elevated temperature and distillatory separation of the esterification product into a raw dimethyl terephthalate fraction, a fraction rich in methyl p-toluate, and a high-boiling distillation residue containing the oxidation catalyst, which comprises mixing an organic phase, resulting from an aqueous pre-treatment of the high-boiling distillation residue, with an extractant comprising water or a diluent aqueous solution of at least two water soluble, low-molecular weight, aliphatic monocarboxylic acid at 70° to 160° C.; introducing the resulting mixture of extractant and organic phase into a first settling tank, discharging a first aqueous phase from said settling tank, introducing said first aqueous phase into a mixing vessel, introducing the distillation residue into said mixing vessel, discharging an emulsion of the first aqueous phase and said distillation residue from said vessel into a second settling tank, discharging an aqueous extract from said second settling tank containing a major portion of the catalyst initially present in said distillation residue and withdrawing the organic phase to be mixed with said extractant from said second settling tank; the high-boiling distillation residue and the

extractant being employed in a quantitative weight ratio of one part of residue per 0.9 to 0.1 part of the extractant and the organic phase initially separated from the emulsion and the extractant being mixed together at temperatures between 85° and 100° C. within a period of from 0.1 to 400 seconds.

2. The process according to claim 1, characterized in that the catalyst-containing extract is filtered to remove iron impurities before being recycled into the oxidation.

3. The process according to claim 1, characterized in that the organic phase prior to extraction is combined with a diluent of a lower viscosity, said diluent being miscible with the residue and being poorly miscible or immiscible with water.

4,464,478

CATALYST COMPONENTS AND CATALYSTS FOR POLYMERIZING OLEFINS

Umberto Scatá, Ferrara; Enrico Albizzati, Arona, and Enzo Giannetti, Novara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 238,647, Feb. 26, 1981, abandoned, which is a continuation of Ser. No. 87,395, Oct. 22, 1979, abandoned. This application Sep. 30, 1982, Ser. No. 428,976

Claims priority, application Italy, Oct. 23, 1978, 28994 A/78

Int. Cl.³ C08F *4/64*

U.S. Cl. 502—111 **5 Claims**

1. Process for preparing components of catalysts for the polymerization of olefins which comprises mixing the solid product of the reaction of:

(a) a halogenated Ti-compound containing at least a Ti-halogen bond, and

(b) an electron-donor compound which does not contain active hydrogen atoms (ED) reacted as such or as a complex with product (c) prepared without cogrinding of the product (c) with compound (ED), and employed in such amount and under such conditions, that from 0.2 to 4 moles of compound (ED) per gram atom of Ti of compound (a) are present in the catalyst component;

with

(c) the solid product prepared without cogrinding, of the reaction between at least one electron-donor compound containing active hydrogen atoms (HED), selected from among the group consisting of aliphatic, cycloaliphatic and aromatic alcohols and thioalcohols having 1 to 20 C, phenols and thiophenols having 6 to 20 C and silanols having 1 to 20 C, and a Mg dihalide, or a complex of said Mg dihalide with a compound (ED), obtained by reaction of halogenating agents other than the Ti compounds of (a), with an organic Mg compound of formula:

$$R_mMgX_n$$

in which R is an alkyl, alkenyl, cycloalkyl or aryl radical containing 1 to 20 C, or a group OR, X is a halogen or a radical R, OR or COX' in which R has the meaning stated, X' is halogen, $0<m\leq 2$, $0\leq n<2$, and $n+m$ is 2, product (c) being reacted as such, without any intermediate pretreatment with an Al-alkyl compound.

4,464,479

METHOD FOR TREATING RED MUD

Günter Ritter, Brühl; Uwe Lenz, Frechen, and Paul Lazik, Cologne, all of Fed. Rep. of Germany, assignors to Rheinische Braunkohlenwerke AG, Cologne, Fed. Rep. of Germany

Filed Apr. 27, 1983, Ser. No. 488,929

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1982, 3215727

Int. Cl.³ B01J *21/18, 31/02*; C10G *1/06*

U.S. Cl. 502—185 **19 Claims**

1. A method of treating red mud to improve its transportability and storability wherein the red mud with a moisture content of between 40 and 60% by weight is mixed with a sufficient amount of fine coal material to form a granular mixture.

4,464,480

METHOD FOR OBTAINING IMPROVED CATALYST SYSTEMS

Hassan Windawi, and Randy J. Lawson, both of Arlington Heights, Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed May 27, 1983, Ser. No. 498,625

Int. Cl.³ B01J *21/02, 31/02*

U.S. Cl. 502—207 **14 Claims**

1. A method for the preparation of an iron catalyst system which comprises treating an iron-containing compound with a structural promoter to form an iron-containing structural promoted catalyst, then contacting said catalyst at a temperature in the range of from about −80° C. to about ambient temperature, in a non-aqueous solution, with an alkali metal borohydride, to afford a catalyst system having from about 0.2 to about 5 wt % alkali based on the weight of the catalytic components, said non-aqueous solvents being selected from the group consisting of ethers, paraffins, cycloparaffins and aromatics, and recovering the resultant iron catalyst system with optimized catalyst activity.

4,464,481

HYDROCRACKING CATALYST

Lee Hilfman, and Mark J. O'Hara, both of Mount Prospect, Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Aug. 25, 1983, Ser. No. 526,235

Int. Cl.³ B01J *21/08, 23/12*

U.S. Cl. 502—228 **2 Claims**

1. A hydrocracking catalyst composite comprising a combination of a nickel component, a tungsten component, and a fluorine component with a cogelled silica-thoria carrier material consisting of from about 25% to about 99% by weight silica and from about 1% to about 75% by weight thoria and wherein said nickel, tungsten, and fluorine components are present in amounts sufficient to result in the composite containing, on an elemental basis, about 0.5% to about 2% by weight of the nickel component, about 0.5% to about 14% by weight of the tungsten component, and about 1% to about 3% by weight of fluorine component.

4,464,482

THREE DIMENSIONAL INTERSTITIAL CATALYST SUPPORT AND ITS MANUFACTURE

Alfred J. Bird, Hounslow, and Frank King, Reading, both of England, assignors to Johnson Matthey Public Limited Company, London, England

Continuation-in-part of Ser. No. 324,485, Nov. 24, 1981, abandoned. This application Nov. 3, 1982, Ser. No. 438,733

Claims priority, application United Kingdom, Nov. 27, 1980, 8038020; Mar. 18, 1981, 8108392; Apr. 21, 1981, 8112331; Sep. 9, 1981, 8127289

Int. Cl.³ B01J *23/38, 23/48, 35/00*

U.S. Cl. 502—325 **15 Claims**

1. A three dimensional interstitial catalyst support suitable for use in a fluid/interstitial solid catalysed reaction wherein the support comprises a three dimensional wire interstitital structure composed of five or more superimposed intermeshing two dimensional layers of knitted wire interstitial cloth in which the volume of the interstices in the structure is from 60 to 98% of the total volume of the structure and in which the surface of the wire is provided with an oxide moiety suitable for bonding a catalyst component to the wire and which holds together adjacent portions of the layers of cloth to make the structure more form-stable.

4,464,483

PROCESS FOR THE PREPARATION OF METHANOL

Hans C. de Lathouder, Geleen, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Jun. 14, 1982, Ser. No. 388,501

Claims priority, application Netherlands, Jun. 12, 1981, 8102840

Int. Cl.³ C07C 27/06

U.S. Cl. 518—703 3 Claims

1. In a process for the preparation of methanol by converting a hydrocarbon feed containing a hydrocarbon having from 1–3 carbon atoms or a mixture thereof into a gas mixture containing carbon monoxide and hydrogen, and converting this gas mixture at elevated temperature and pressure in the presence of a suitable catalyst into methanol, the improvement comprising the steps of:

introducing said hydrocarbon feed into a partial oxidation zone, together with oxygen, between 1.0 and 2.5 mols of water per mol of carbon, and recycle non-converted gaseous components hereinafter referenced in an amount such that between 0.05 and 0.50 mol of hydrogen is introduced into said partial oxidation zone for every mole of hydrocarbon, wherein said hydrocarbon feed is partially oxidized at a pressure of between 30 and 60 bar and a partial oxidation zone outlet temperature of between 900° and 1100° C., in the presence of a suitable catalyst to form a first gas mixture substantially consisting of carbon monoxide, carbon dioxide, hydrogen, and water;

introducing said first gas mixture into a scrubbing zone wherein a portion of the carbon dioxide contained in said first gas mixture is removed therefrom by adsorption into methanol at a pressure of between 40 and 100 bar and at a temperature of between 15° and 40° C. to form a carbon dioxide-loaded methanol stream and a second gas mixture having an $H_2/2\ CO+3\ CO_2$ molar ratio of between 0.95 and 1.05;

feeding said second gas mixture into a synthesis reaction zone wherein it is converted in the presence of a suitable catalyst and at a temperature of between 240° and 320° C. and a pressure of between 40 and 100 bar to form a third gas mixture containing methanol;

cooling said third gas mixture and separating a crude methanol stream from remaining non-converted gaseous components including hydrogen;

recycling at least a portion of said remaining non-converted gaseous components to said partial oxidation zone;

introducing at least a portion of said crude methanol stream into said scrubbing zone wherein it is utilized to absorb carbon dioxide from said first gas mixture to form said carbon dioxide-loaded methanol stream; and

expanding said carbon dioxide-loaded methanol stream from said scrubbing zone to approximately atmospheric pressure whereupon carbon dioxide is removed therefrom and at least a portion of the resulting methanol stream is further purified to form product methanol,

wherein the energy released in said partial oxidation zone and said synthesis reaction zone is utilized for the generation of stream in an amount at least sufficient to provide the energy requirements of an oxygen separation plant of sufficient capacity to provide said oxygen introduced into said partial oxidation zone.

4,464,484

PROCESS FOR PRODUCING PREFOAMED POLYMER PARTICLES

Shohei Yoshimura, Tomioka, and Hideki Kuwabara, Hatano, both of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Filed Dec. 13, 1983, Ser. No. 561,095

Claims priority, application Japan, Dec. 20, 1982, 57-221936; Jan. 7, 1983, 58-976; May 4, 1983, 58-78668

Int. Cl.³ C08J 9/22

U.S. Cl. 521—58 10 Claims

1. A process for producing prefoamed polymer particles, which comprises a step of impregnating carbon dioxide in polymer particles, a step of dispersing the polymer particles into a dispersion medium in a sealed vessel, a step of heating the polymer particles to a temperature higher than the softening point of said polymer particles, and a step of opening one end of said vessel and simultaneously releasing the polymer particles and dispersion medium from inside the vessel to an atmosphere held at a pressure lower than that of the vessel.

4,464,485

METHOD OF PRODUCING POROUS MATERIAL HAVING OPEN PORES

Noboru Kishima; Yoshio Ueda, and Takeshi Sato, all of Kitakyusyu, Japan, assignors to Toto, Ltd., Kitakyusyu, Japan

Filed Jan. 9, 1984, Ser. No. 569,294

Int. Cl.³ C08J 9/28

U.S. Cl. 521—64 8 Claims

1. A method of producing a porous material having open pores, comprising the steps of preparing a slurry from a mixture comprising a bisphenol-type epoxy resin, a hardener, a filler and water, casting said slurry in a water-impermeable mold, hardening said slurry while it contains the water and dehydrating the hardened body, wherein the improvement comprises that said hardener is either (a) a mixture of (i) an amide compound which is obtained through a reaction between a monomeric fatty acid and an ethyleneamine expressed by the formula of $H_2N—(CH_2—CH_2—NH)_n—H$ where "n" be 3 to 5, and (ii) a polymeric fatty acid polyamide obtained through a reaction of a polymeric fatty acid and said ethyleneamine, or (b) a reaction mixture obtained by mixing reaction of said monomeric fatty acid, said polymeric fatty acid and said ethyleneamine.

4,464,486

FOAMS OF SILICATES AND POLY(METH)ACRYLIC ACIDS

Hans Kramer, Hinwil; Sheik A. Zahir, Oberwil, and Ewald Forster, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 20, 1983, Ser. No. 515,414

Claims priority, application Switzerland, Jul. 29, 1982, 4595/82

Int. Cl.³ C08J 9/14, 9/30

U.S. Cl. 521—83 8 Claims

1. An inorganic-organic foam which is based on a water-soluble silicate and can be prepared by foaming and hardening a mixture, which can be hardened at room temperature, of

(a) a 5 to 60% by weight aqueous alkali metal silicate or ammonium silicate solution,

(b) a sufficient amount of a hardener for aqueous silicate solutions,

(c) a polymer of (meth)acrylic acid or a copolymer of acrylic acid and methacrylic acid or of (meth)acrylic acid and a copolymerisable monomer containing ethylinic double bonds, the polymer and copolymer being soluble in the aqueous silicate solution, some or all of the carboxyl groups of the polymer or copolymer, where relevant, being neutralised by a base and the amount of polymer or copolymer being 0.1 to 30 parts per 100 parts of SiO_2 contained in the aqueous silicate solution,

(d) a blowing agent,

(e) a surfactant having a foaming action and, where relevant,

(f) gelling agent for solidifying the foam before hardening and/or conventional fillers.

4,464,487

PROCESS FOR PREPARING ADDITIVE CONCENTRATES FOR CARBONATE POLYMERS

Lowell S. Thomas, and William P. Paige, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 17, 1982, Ser. No. 450,714
Int. Cl.³ C08K 3/00, 3/10; C08L 69/00
U.S. Cl. 521—90 9 Claims

1. An improved process for dispersing a dry powdered or crystalline additive into a carbonate polymer which comprises preparing a base concentrate by dry blending at a temperature lower than that employed in processing a carbonate polymer, a powdered or crystalline additive and a copolymer of an alkenylaromatic monomer and an α,β-olefinically unsaturated nitrile monomer; molding or extruding the base concentrate; dry blending said base concentrate with a carbonate polymer; and molding or extruding the carbonate polymer/base concentrate.

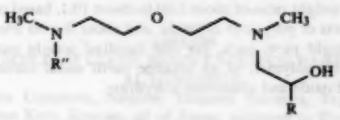
4,464,488

POLYURETHANES USING MONOCARBOXYLIC ACID SALTS OF BIS(AMINOETHYL)ETHER DERIVATIVES AS CATALYSTS

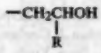
Robert L. Zimmerman, and Bruce W. Peterson, both of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 11, 1983, Ser. No. 522,147
Int. Cl.³ C08G 18/14, 18/18
U.S. Cl. 521—115 13 Claims

1. A method for producing a polyurethane which comprises reacting an organic polyisocyanate with an organic polyester polyol or polyether polyol in the presence of a catalytic amount of an increased activity monocarboxylic acid salt of an amine of the formula



where R is hydrogen or lower alkyl of 1 to 4 carbon atoms and R″ is methyl or



where R is as above.

4,464,489

METHOD FOR THE PRODUCTION OF POLYIMIDE POWDER

Yuzuru Noda, and Toshio Nakajima, both of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

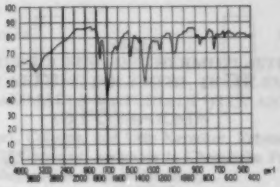
Filed Dec. 12, 1983, Ser. No. 560,304
Claims priority, application Japan, Dec. 11, 1982, 57-217619
Int. Cl.³ C08J 9/02
U.S. Cl. 521—117 8 Claims

1. A process for producing spherical porous polyimide powder comprising:

(a) polymerizing at least one aromatic tetracarxylic acid dianhydride which forms an infusible insoluble polyimide and an approximately the same quantity of at least one aromatic polyisocyanate in an organic solvent at a temperature of 100° to 200° C. and in the presence of a tertiary amine catalyst to form said polyimide particles in the form of slurry;

(b) filtering or centrifuging said polyimide particles; and

(c) washing the resulting polyimide particles with an organic solvent,



wherein the resulting spherical porous polyimide powder has an average particle diameter of 1 to 20 μm.

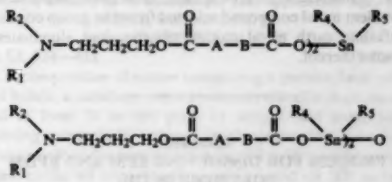
4,464,490

AMINO AND AMIDO DIALKYL TIN CARBOXYLATES AND THEIR USE IN PREPARING POLYURETHANE PRODUCTS

Ibrahim S. Bechara, Bosthwyn, and Rocco L. Mascioli, Media, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of Ser. No. 418,519, Sep. 16, 1982, Pat. No. 4,430,456, which is a division of Ser. No. 230,849, Feb. 2, 1981, Pat. No. 4,360,670. This application Mar. 18, 1983, Ser. No. 476,898
The portion of the term of this patent subsequent to Nov. 28, 1999, has been disclaimed.
Int. Cl.³ C08G 18/14, 18/24; C07F 7/22; C07D 207/00
U.S. Cl. 521—128 12 Claims

1. Compounds corresponding to either of the formulae:



wherein

R_1 and R_2 are independently H, alkyl of 1 to 20 carbon atoms; hydroxyalkyl of 2 to 20 carbon atoms; or R_1 and R_2 together form a heterocyclic ring of 5 or 6 atoms;

A and B are carbon atoms linked by a single or double bond or together comprise part of a six membered ring from the group consisting of cyclohexane, cyclohexene and benzene;

R_4 and R_5 are independently alkyl groups of 1 to 20 carbon atoms, phenyl or cycloalkyl groups of 6 to 20 carbon atoms.

4. The method of catalyzing the reaction between an organic isocyanate and an organic compound having at least one active hydrogen containing group, which comprises effecting said reaction in the presence of a catalytic amount of an organotin compound corresponding to one of the formulae set out in claim 1.

4,464,491

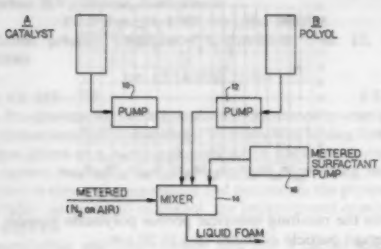
NYLON FOAM

Bruce G. Kosa, Woodstock, Conn., assignor to Rogers Corporation, Rogers, Conn.

Division of Ser. No. 516,779, Jul. 25, 1983. This application Nov. 3, 1983, Ser. No. 548,435
Int. Cl.³ C08J 9/30
U.S. Cl. 521—134 1 Claim

1. A nylon block copolymer foam having a density of about

10 lbs/ft^3 to about 60 lbs/ft^3 formed by frothing a mixture of a catalyzed molten caprolactam with a molten caprolactam



containing a polyol prepolymer prepared by reacting a polyol with bis acyllactam in the presence of a silicone-based surfactant.

4,464,492

FOUNDRY BINDER

John F. Kraemer, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Jan. 25, 1982, Ser. No. 342,310
Int. Cl.^{3} B28B *7/34*
U.S. Cl. 523—139 **8 Claims**

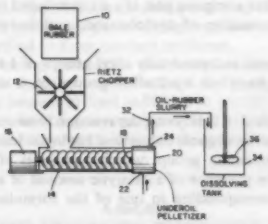
1. A binder composition for a foundry aggregates comprising polyvinylammonium phosphate and a hardener selected from the group consisting of a linear alkali metal polyphosphate, ammonium polyphosphate, orthophosphoric acid, a polyvalent metal compound selected from the group consisting of alkaline earth metal oxides, silicates, and aluminates or mixtures thereof.

4,464,493

PROCESS FOR DISSOLVING EPM AND EPDM POLYMERS IN OIL

Ralph K. Joffrion, Baton Rouge, La., assignor to Copolymer Rubber & Chemical Corp., Baton Rouge, La.

Filed Sep. 13, 1982, Ser. No. 417,651
Int. Cl.^{3} C08K *5/01*
U.S. Cl. 523—319 **8 Claims**



1. The method of taking a solid, high molecular weight EPM or EPDM polymer into solution in oil comprising the steps of working the polymer to effect degradation of the polymer during passage through an extruder at elevated temperature, reducing the particles to small dimension as the degraded polymer issues from the die face of the extruder, and circulating hot oil across the die face of the extruder, whereby the polymer particles become admixed with the oil for solution therein.

4,464,494

ADHESIVE SYSTEM FOR PRODUCTION OF SPIRAL WOUND MEMBRANE ELEMENTS FOR USE IN ORGANIC FLUID MIXTURE SEPARATIONS

William M. King, Los Alametos, and William W. Wight, Alta Loma, both of Calif., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 13, 1983, Ser. No. 494,409
Int. Cl.^{3} C08G *59/44, 59/54*
U.S. Cl. 523—400 **23 Claims**

1. A solvent resistant adhesive for use in producing membrane edge seals in the production of elements, which are suitable for organic fluid separations, which adhesive comprises an epoxy resin formulation which is (1) a reaction product of bisphenol-A and epichlorohydrin, (2) a thickening agent, (3) a low temperature, low exotherm polyamide or amidoamine curing agent, and (4) a diluent wherein the components 1/2/3/4 are present in a ratio based on parts by weight of about 100/0-15/40-70/8-32.

4,464,495

SMOKE RETARDANT VINYL HALIDE POLYMER COMPOSITIONS

Randall J. Brown, Sheffield Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 14, 1982, Ser. No. 378,378
Int. Cl.^{3} C08K *5/34;* **C09K** *3/28*
U.S. Cl. 524—87 **10 Claims**

1. An improved flame resistant low smoke generating vinyl halide polymer composition comprising a vinyl halide polymer, smoke retarding amounts of copper oxalate and an amine molybdate present in amounts from about 1 to 20 total weight parts in a weight ratio of about 1:10 to about 10:1, based on 100 weight parts of polyvinyl chloride, and about five to less than fifteen weight parts each, per one hundred weight parts of vinyl halide polymer, of an alkaline earth metal carbonate, titanium dioxide and aluminum trihydrate.

4,464,496

NON-YELLOWING POLYMER COMPOSITION

Thomas L. Nemzek, Houston, Tex., and Brendan J. Geelan, East Haven, Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Mar. 26, 1982, Ser. No. 362,221
Int. Cl.^{3} C08K *5/20, 5/34*
U.S. Cl. 524—91 **8 Claims**

1. A polymer composition normally subject to yellowing comprising a blend of (I) and (II) as defined below said composition being protected against yellowing by an antioxidant-UV stabilizer combination (A) and (B) as defined below,

(I) being a graft copolymer of resin-forming monomeric material comprising a vinyl aromatic, alkenoic nitrile, ester or acid, or mixture thereof, on a rubbery EPM or EPDM spine, and

(II) being separately prepared resin made from said monomeric material,

wherein (I) is prepared in the presence of

(A) an antioxidant mixture of (i) a thiodialkylene bis(3,5-dialkyl-4-hydroxy)hydrocinnamate and (iii) O,O-dialkyl-3,5-dialkyl-4-hydroxybenzyl phosphonate; the blend of (I) and (II) further containing

(B) a UV stabilizer package comprising:

(vi) at least one UV stabilizer of the hindered amine type, with or without

(vii) at least one UV absorber.

4,464,497

CARBON BLACK FILLED FLAME RETARDANT POLYCARBONATE COMPOSITIONS

Edward L. Belfoure, New Harmony, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 15, 1982, Ser. No. 449,981
Int. Cl.³ C08K 5/52
U.S. Cl. 524—114 13 Claims

1. A composition comprising a thermally and hydrolytically stabilized high molecular weight copolyester carbonate in admixture with

a. a flame retardant effective amount of a metal salt of an organic sulfonic acid; and

b. a black pigmenting effective amount of a carbon black of such low surface area that melt degradation is markedly retarded, said carbon black having a surface area of less than about 150 m^2/gm.

4. The composition in accordance with claim 1 wherein the copolyester carbonate has been hydrolytically stabilized by an epoxide.

4,464,498

MEMBRANE FOR CONCENTRATING AMINO ACIDS AND PROCESS FOR CONCENTRATING AMINO ACIDS

Masaaki Sugiura, Yatabe, Japan, assignor to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Feb. 19, 1982, Ser. No. 350,229
Claims priority, application Japan, May 20, 1981, 56-76103
Int. Cl.³ C08K 5/52
U.S. Cl. 524—145 4 Claims

1. An amino acid concentrating membrane, which comprises a polyvinyl chloride composition containing 30 to 70 wt. % of trialkyl phosphate ester each alkyl of which has 1 to 6 carbon atoms and 2 to 10 wt. % of halogenated hydrocarbon selected from the group consisting of hexachloro-1,3-butadiene, 1,8-dichlorooctane and 1,10-dichlorodecane.

4,464,499

WAX FOR LOW GLOSS RESIN EXTERIOR PARTS OF AN AUTOMOBILE

Yoshiro Umemoto, Nagoya; Tsugumi Sanmiya, Toyota, and Mituo Kato, Kawana, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Sanko Chemical Co., Ltd., Inazawa, both of, Japan

Filed May 19, 1983, Ser. No. 495,995
Claims priority, application Japan, Jun. 23, 1982, 57-107974
Int. Cl.³ C08K 5/09; C08L 91/06; C09G 1/08
U.S. Cl. 524—230 12 Claims

1. A wax which is suitable for use on low gloss resin exterior parts of an automobile which comprises:

a microcrystalline wax having a melting point of 50° to 100° C., or a paraffin wax having a melting point of 40° to 70° C., or a mixture thereof, a fatty acid amide, and isoparaffin or normal paraffin solvent having a boiling point of 100° to 250° C., or a mixture thereof, and dimethylsilicone.

4,464,500

POLYMERIC COMPOSITION AND USE THEREOF

Jeffrey Diamond, 3474 S. Ocean Blvd., Palm Beach, Fla. 33480, and David S. Winkler, 4030 N. Firestone, Wooster, Ohio 44691

Filed Aug. 9, 1983, Ser. No. 521,768
Int. Cl.³ C08K 5/17; C08L 45/00
U.S. Cl. 524—258 22 Claims

1. A polymeric composition comprising:

(A) about 55 to about 65 parts by weight of a butyl-type rubber selected from the group of butyl rubber, bromobutyl rubber, chlorobutyl rubber, or mixtures thereof;

(B) about 35 to about 45 parts by weight of an ethylene, a higher α-olefin and a polyene polymer; and

(C) about 25 to about 35 parts by weight of amorphous and have a high melt index or high molecular weight polyethylene; wherein the above amounts by weight are based upon 100 parts by weight of the total of (A) and (B).

4,464,501

FLAMEPROOFING OF THERMOPLASTICS, THERMOSETTING POLYMERS, TEXTILES, AND OTHER FLAMMABLE MATERIALS WITH ANTIMONY OXY COMPOUNDS

Rainer Taubert, Cologne, and Utto Kerscher, Erftstadt, both of Fed. Rep. of Germany, assignors to Chemische Fabrik Kalk GmbH, Cologne, Fed. Rep. of Germany

Filed Aug. 27, 1981, Ser. No. 296,664
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 3032192
Int. Cl.³ C08K 3/30
U.S. Cl. 524—410 4 Claims

1. In a flameproofed polymeric composition comprising a thermoplastic synthetic resin, a thermosetting synthetic resin, or an elastomer and a halogen-containing flameproofing component and an antimony-containing flameproofing component the improvement wherein the antimony-containing flameproofing component is $Sb_4O_5SO_4$.

4,464,502

LOW SMOKE PLASTICIZED POLYVINYL CHLORIDE

Martin I. Jacobs, Southbury, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Continuation of Ser. No. 210,646, Nov. 26, 1980, abandoned, which is a continuation of Ser. No. 928,489, Jul. 27, 1978, abandoned, which is a continuation of Ser. No. 771,871, Feb. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 638,404, Dec. 8, 1975, abandoned. This application Apr. 12, 1982, Ser. No. 367,714
Int. Cl.³ C08K 3/22, 3/26
U.S. Cl. 524—411 9 Claims

1. A composition of matter comprising a thermoplastic polyvinyl halide, a stabilizer, and a plasticizer therefor in an amount equal to from 30 to 100 parts by weight said composition exhibiting substantially reduced smoke generation upon burning as a result of the presence therein of 2 to 30 parts by weight of zinc oxide, all concentrations being based on 100 parts by weight of polyvinyl halide.

4,464,503

POROUS PARTICULATE POLYVINYL CHLORIDE IMPREGNATED WITH ALKYL VINYL AND ALKYL METHACRYLATE POLYMERS

Minoru Ushioda, Amagasaki; Kenji Ueno, Takasago, and Masahiro Kobayashi, Amagasaki, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka

Filed Mar. 17, 1982, Ser. No. 358,890
Claims priority, application Japan, Mar. 20, 1981, 56-40826
Int. Cl.³ C08F 259/04
U.S. Cl. 524—425 7 Claims

1. A particulate vinyl chloride polymer composition which comprises porous particles of a vinyl chloride polymer and 2 to 20 parts by weight of, per 100 parts by weight of said vinyl chloride polymer, a polymer mixture of alkyl vinyl polymers produced by impregnating and polymerizing an alkyl vinyl compound and then an alkyl methacrylate in the presence of said porous particles, said alkyl vinyl polymers being a polymer of (a) a fatty acid vinyl ester monomer having a C_4 to C_{18} alkyl group, a polymer of (b) an alkyl methacrylate having a C_1 to C_4 alkyl group and a copolymer of said fatty acid vinyl ester (a) and said alkyl methacrylate (b), the weight ratio of said component (a) to said component (b) in said polymer mixture being from 90/10 to 60/40 and said porous particles being substantially filled with said polymer mixture.

4,464,504

FREON-CORROSION, IMPACT AND COLD RESISTANT FLAME-RETARDANT POLYSTYRENE BLEND CONTAINING ZEOLITES HAVING CATION(S) OF MG, CO, SB, OR MO

József K. Kocsis; László Kiss; Zoltán Balajthy; Peter Nagy; Gizella Pál nee Hazkotó, all of Budapest; Miklós Zaruhai, Jaszbereny; Géza Sipos, Jaszbereny; András Romhányi, Jaszbereny, and Rudolf Kókai, Jaszbereny, all of Hungary, assignors to Müanyagipari Kutató Intézet and Hütogépgyár, Budapest, Hungary

Filed Feb. 22, 1983, Ser. No. 468,588

Claims priority, application Hungary, Feb. 22, 1982, 521/82

Int. Cl.³ C08K *3/10*

U.S. Cl. 524—443 **4 Claims**

1. A freon-corrosion, impact and cold resistant and flame-retardant polystyrene blend, comprising 50 to 98 mass % of polystyrene or impact resistant polystyrene,

0.01 to 15 mass % of zeolites with a pore size above 0.43 nm,

2 to 18 mass % of a styrene/butadiene block copolymer,

0 to 15 mass % of a flame retardant and

0 to 2 mass % of a surface-active agent,

wherein the zeolites contain a cation of Mg—, Co—, Sb— or Mo—, such cation being introduced into the zeolite by ion exchange.

4,464,505

COATING COMPOSITION FOR PROVIDING WATER AND BLISTER RESISTANT, INK-RECEPTIVE PAPER

Shigenao Kawakami, Nara; Terumasa Saka, Osaka; Shigeru Ura, Nara; Mikio Iwata, Osaka; Yoshiharu Tokugawa, Hyogo, and Naoyoshi Jinno, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 13, 1982, Ser. No. 449,333

Claims priority, application Japan, Apr. 16, 1982, 57-64191; Apr. 16, 1982, 57-64192

Int. Cl.³ C08L *61/20*

U.S. Cl. 524—512 **20 Claims**

1. A paper coating composition containing a pigment and an aqueous binder as major components, and further containing a mixture of (X) a reaction product between (a) at least one alkylenediamine or polyalkylenepolyamine and (b) epihalohydrin, and (Y) a water-soluble resin obtained by reacting urea, polyalkylenepolyamine, and dibasic carboxylic acid to form a polyamidopolyurea and reacting the resulting polyamidopolyurea with formaldehyde, or containing these reaction products.

4,464,506

GRAFT-MODIFIED SILOXANE DISPERSIONS FOR FINISHING TEXTILE MATERIALS

Heinrich Alberts, Odenthal; Helmut Steinberger, Leverkusen, and Wilfried Kortmann, Hagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 30, 1982, Ser. No. 454,829

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1982, 3201205

Int. Cl.³ C08F *283/12*

U.S. Cl. 524—588 **6 Claims**

1. In the finishing of a textile by applying thereto a finishing agent containing an organosiloxane, the improvement which comprises employing as said finishing agent an aqueous dispersion comprising water, an emulsifying agent and a material produced by subjecting to free radical polymerization a composition comprising

(A) an organopolysiloxane containing vinyl groups,

(B) an organopolysiloxane containing Si-H groups, and

(C) a polymerizable vinyl monomer, some of the organopolysiloxane components being linked via polymerized units of the vinyl monomer and some of the Si-H groups of the Si-H-organopolysiloxane being modified by mono-addition of the vinyl monomer.

4,464,507

PROCESS FOR THE PRODUCTION OF HIGH MOLECULAR WEIGHT, OPTIONALLY BRANCHED, POLYARYLENE SULPHIDES

Edgar Ostlinning, Duesseldorf, and Karsten Idel, Krefeld, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 11, 1983, Ser. No. 483,627

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1982, 3215259

Int. Cl.³ C08K *5/49*

U.S. Cl. 524—710 **3 Claims**

1. A process for the production of high molecular weight, optionally branched, polyarylene sulfides which comprises condensing:

(a) diahalogen benzenes;

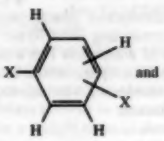
(b) aromatic tri- or tetra-halogen compound in an amount of from 0 to 2.4 mol% based on (a);

(c) alkali metal sulphides, where the molar ratio of (a)+(b):(c) is from 0.85:1 to 1.15:1; in an

(d) cyclic organophosphorus compound solvent, where the molar ratio of (c):(d) is from 1:2 to 1:15;

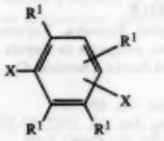
over a period of up to 10 hours at a temperature of from 160° to 240° C. and where

(a) are dihalogen benzenes from 50 to 100 mol%:



and

from 0 to 50 mol %:



wherein X represents fluorine, chlorine, bromine and iodine; and R^1, which may be the same or different, represents hydrogen, C_1–C_{20} alkyl, C_5–C_{20} cycloalkyl, C_6–C_{24} aryl, C_7–C_{24} alkaryl or C_7–C_{25} aralkyl and/or two of the R^1 substituents may be linked together to form an aromatic or heterocuclic ring and at least one of the R^1 substituents represents other then hydrogen; and

(b) is an aromatic tri- or tetra-halogen compound:

$$ArX_n$$

wherein Ar represents an aromatic or heterocyclic ring containing from 6 to 24 carbon atoms; and n represents 3 or 4; and

(d) are cyclic organophosphorus compound solvents:

wherein R^2 represents an unsubstituted or substituted α,ω-butylene or α,ω-pentylene; R^3 represents a C_1–C_8 alkyl, C_6–C_{12} aryl, C_7–C_{20} aralkyl or C_5–C_{10} cycloalkyl.

4,464,508

WATER-IN-OIL EMULSIONS OF WATER-SOLUBLE CATIONIC POLYMERS HAVING IMPROVED STABILITY

James P. Easterly, Jr., Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 30, 1982, Ser. No. 429,951
Int. Cl.[3] C08K *3/14, 3/28, 3/30*
U.S. Cl. 524—787 9 Claims

1. A water-in-oil emulsion comprising (1) a discontinuous aqueous phase containing a water-soluble cationic polymer which aqueous phase is dispersed as colloidal size particles or droplets in (2) a continuous oil phase wherein the emulsion contains an emulsion stabilizing amount of a water-soluble salt of a monovalent anion and an emulsifying amount of a water-in-oil emulsifier, said salt added prior to polymerization to form the water-soluble cationic polymer.

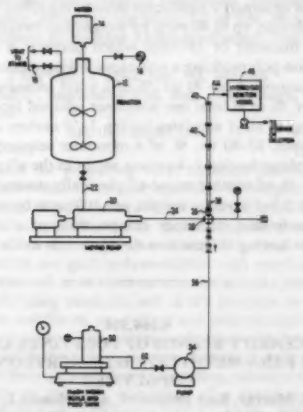
8. A method for preparing the emulsion of claim 1, 5 or 7 which comprises (1) forming a stable water-in-oil emulsion (monomeric precursor) containing at least one water-soluble cationic monomer in the aqueous phase which is dispersed in a continuous oil phase, said emulsion containing a stabilizing amount of a water-soluble salt of a monovalent anion and an emulsifying amount of a water-in-oil emulsifier; and (2) subjecting the monomeric precursor to conditions sufficient to polymerize the monomer.

4,464,509

APPARATUS AND METHOD FOR PREPARING POLYMERS

Donald E. Schroeder, Jr., Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jul. 20, 1983, Ser. No. 515,402
Int. Cl.[3] C08C *19/00*
U.S. Cl. 525—53 9 Claims



1. A method of preparing an aqueous polymer solution for use in the displacement of oil from a subterranean oil-bearing formation, comprising: forming in a reaction vessel an aqueous reaction mixture containing a polymerizable substance and a polymerization initiator, said polymerizable substance including a monomer having at least one vinyl grouping wherein the vinyl group is an acrylyl vinyl, a vinyl cyanide, a styryl vinyl, or a water soluble salt thereof; maintaining the reaction mixture in said vessel until polymerization of the polymerizable substance is substantially complete to provide an aqueous polymer solution; forming the aqueous polymer solution into a stream, the concentration of polymer in said solution being about 4% to about 8% by weight; injecting at substantially the center line of flow, and in the direction of flow, of the aqueous polymer solution stream an aqueous solution containing a hydrolyzing agent capable of reacting with the polymer in the aqueous polymer solution, the concentration of the hydrolyzing agent in the aqueous solution thereof being about 10% to about 50% by weight, the ratio of hydrolyzing agent solution to aqueous polymer solution injected being about 0.5 to about 2 parts of hydrolyzing agent solution to about 100 parts of aqueous polymer solution; passing the combined solutions through static mixers at a flow rate such that the hydrolyzing agent is intimately admixed with the polymer solution; and maintaining the hydrolyzing agent and the polymer solution in an intimately admixed state until hydrolyzation of the polymer is essentially complete.

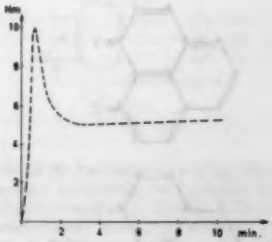
7. Apparatus for the on-site preparation of aqueous polymer solutions for use in the displacement of oil from subterranean oil-bearing formations, comprising: a reactor vessel for polymerizing an aqueous solution of a monomer in the presence of a polymerization catalyst; flow control means for forming the aqueous polymer solution from the reactor vessel into a stream having a predetermined flow rate, the concentration of the polymer in said stream being about 4% to about 8% by weight; flow control means including a nozzle having a restricted orifice for introducing a stream of an aqueous solution of a hydrolyzing agent into the aqueous polymer solution stream, said nozzle being positioned in the polymer solution stream at substantially the center line of flow thereof and facing in the direction of flow of said polymer solution stream; static mixers for intimately admixing the combined streams as they flow therethrough, the inlet side of said mixers being positioned adjacent to said nozzle; and means for maintaining the hydrolyzing agent and the polymer solution in an intimate admixed condition until hydrolyzation of the polymer is essentially complete.

4,464,510

PROCESS FOR THE PREPARATION OF A MATERIAL OF COMPOSITE STRUCTURE

Tibor J. Czvikovszky; Tamás Pazonyi; Lászlóné I. Topolcai, and János Klebán, all of Budapest, Hungary, assignors to Mûanyagipari Kutató Intézet, Budapest, Hungary

Filed Aug. 17, 1982, Ser. No. 408,944
Claims priority, application Hungary, Aug. 19, 1981, 2423/81
Int. Cl.[3] C08G *83/00;* C08H *5/04;* C08J *3/24;* B29F *1/00*
U.S. Cl. 525—54.23 4 Claims



1. A process for the preparation of a thermoplastic material of a composite structure containing 20–98% by weight, preferably 30–80% by weight, of a thermoplastic basic plastic, including polyethylene, polypropylene or polyvinyl chloride, and 2–80% by weight, preferably 20–60% by weight of a fibrous polymer skeleton material of natural origin, the thermoplastic material having a high modulus of torsional shear, good shockproofness and being processable by the formation technologies of thermoplastic plastics, characterized in that the fibrous polymer skeleton material is previously treated with a resin mixture consisting of an unsaturated polyester resin and a vinyl monomer in an amount 1–80% by weight, preferably 2–40% by weight, related to the skeleton material.

4,464,511
POLYMERS WHICH HAVE TWO OR MORE STABLE, REVERSIBLY INTERCONVERTIBLE OXIDATION STATES, THEIR PREPARATION AND THEIR USE

Herbert Naarmann, Wattenheim; Klaus Penzien, Frankenthal; Volker Muench, and Klaus-Dieter Franz, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

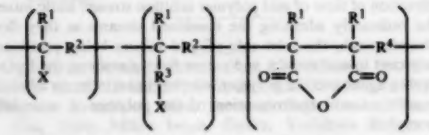
Filed Jul. 1, 1982, Ser. No. 394,184

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1981, 3126264

Int. Cl.³ C08F *8/23, 8/30*

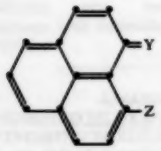
U.S. Cl. 525—61 4 Claims

1. A polymer with a molecular weight of 500 to 1,000,000, capable of forming at least two stable, reversibly interconvertible oxidation states with half-wave potentials $E_{\frac{1}{2}}$ of from −1.5 to +1 V, and contains, as a side group, a 1,9-disubstituted phenalene radical linked to the main polymer chain via the 9-position of the phenylene radical, such polymer being obtained by reacting a vinyl polymer containing reactive groups of the general formula (III), (IV) or (V)

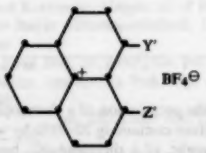


(III) (IV) (VI)

where X is OH, SH, NH_2, $—COOR^1$, —O—C(O)—R^5, COCl or halogen, R^1 is H, C_1–C_5-alkyl or aryl, R^2 is C_1–C_5-alkylene, C_1–C_5-alkylidene or arylene, R^3 is C_1–C_5-alkylene, C_1–C_5-alkylidene, 1,4-cycloalkylene or p-arylene, R^4 is —CH(C_6H-5)—CH_2— and R^5 is C_1–C_5-alkyl, said vinyl polymer containing 5 to 10,000 reactive groups as repeating units, said vinyl polymer having a molecular weight of from 500 to 1,000,000, with a 1,9-disubstituted phenalene of the formula (I) or (II),



(I)



(II)

where Y is O, NR, S, Se or Te, Z is OR, SR, NR_2, —O—$(CH_2)_m$—OR, —NH—$(CH_2)_m$—OR, —S—$(CH_2)_m$—OR, —NH—$(CH_2)_m$—NR_2, —O—$(CH_2)_m$—NR_2, —S—$(CH_2)_m$—NR_2, —O—$(CH_2)_m$—CHO or —N_2MeF_6 where Me is As or Sb, and Y' is —OR, —SR or —NR_2, Z' is —OR, —SR or —NR_2, and R is H, C_1–C_5-alkyl, C_6–C_{12}-cycloalkyl or C_7–C_{14}-aralkyl, and, in the group —NR_2, the two radicals R may also be cyclically linked to one another, and m is 1–5.

4,464,512
COMPOSITION COMPRISING AN AROMATIC POLYESTER-CARBONATE RESIN AND A LINEAR LOW DENSITY POLYOLEFIN POLYMER

Ping Y. Liu, Naperville, Ill., and Kenneth F. Miller, Mt. Vernon, Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Continuation-in-part of Ser. No. 343,950, Jan. 29, 1982, Pat. No. 4,401,785. This application Jul. 5, 1983, Ser. No. 510,597

The portion of the term of this patent subsequent to Aug. 30, 2000, has been disclaimed.

Int. Cl.³ C08G *63/64*

U.S. Cl. 525—146 9 Claims

1. A composition comprising an aromatic copolyester-carbonate having from about 25 to 90 mole percent ester units in admixture with a hydrolytic stabilizing effective amount of a linear low density polyolefin having a density of from about 0.89 to 0.96 gm/cc.

4,464,513
DELUSTERED THERMOPLASTIC RESIN COMPOSITION

Kazuo Kishida, Ohtake; Akira Hasegawa, Hiroshima, and Masahiro Sugimori, Ohtake, all of Japan, assignors to Mitsubishi Rayon Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 173,617, Jul. 30, 1980, abandoned. This application Jul. 22, 1982, Ser. No. 400,619

Claims priority, application Japan, Aug. 21, 1979, 54-106262

Int. Cl.³ C08L *27/06, 33/06*

U.S. Cl. 525—227 8 Claims

1. A delustered thermoplastic resin composition obtained by incorporating in 100 parts by weight of a polyvinyl chloride, a cross-linked polymer in an amount, the minimum of which is sufficient to impart a significant delustering effect to said polyvinyl chloride, up to 40 parts by weight and having an average particle diameter of 35–500μ which polymer is obtained by suspension-polymerizing a non-cross-linking monomer composition comprising 50–70 wt. % of a vinyl aromatic monomer, 10–40 wt. % of at least one monomer selected from the group consisting of alkyl acrylates having 1–13 carbon atoms in the alkyl group, 10–40 wt. % of a monomer selected from alkyl methacrylates having 1–4 carbon atoms in the alkyl group and 0–40 wt. % of another mono-ethylenically unsaturated monomer with 0.5–5 parts by weight, per 100 parts by weight of the non-cross-linking monomer composition, of a cross-linking monomer having at least two double bonds in the molecule.

4,464,514
HIGH CLARITY BLENDS OF POLYVINYL CHLORIDE AND PARA-METHYLSTYRENE-ACRYLONITRILE COPOLYMER

James G. Murray, East Brunswick, and Edmond L. Suek, Skillman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 29, 1983, Ser. No. 489,873

Int. Cl.³ C08L *27/06, 25/12*

U.S. Cl. 525—238 7 Claims

1. In a polymer blend comprising 5 to 90 weight percent of a random copolymer of acrylonitrile and an alkenyl aromatic hydrocarbon, and 10 to 95 weight percent of a polyvinyl chloride polymer containing at least about 80 weight percent polymerized polyvinyl chloride, the improvement comprising using as the sole alkenyl aromatic hydrocarbon a methyl styrene isomer containing at least 90 percent of the para-isomer such that said blend exhibits reduced haze and greater transparency than the corresponding composition in which said alkenyl aromatic hydrocarbon is styrene; said blend being free of additional transparency improving agents.

4,464,515
POLYMER HYDROGENATION PROCESS

Gary L. Rempel, and Hormoz Azizian, both of Waterloo, Canada, assignors to Polysar Limited, Canada

Filed Oct. 11, 1983, Ser. No. 540,408
Claims priority, application Canada, Dec. 8, 1982, 417259
Int. Cl.³ C08F 8/04
U.S. Cl. 525—338 20 Claims

1. An improved process for the selective hydrogenation of the carbon-carbon double bonds in a copolymer of a conjugated diene and one or more copolymerizable monomers which comprises hydrogenating said copolymer at a temperature of from about 40° to about 170° C. and at a pressure of hydrogen of from about 0.05 to about 7 MPa, the improvement being that said hydrogenation is carried out in the presence of (i) from about 0.05 to about 20 percent by weight of a catalyst which is a monovalent rhodium hydride complex of the general formula $RhH(L_1)_x$ in which x is 3 or 4 and L_1 is a first ligand compound, (ii) from about 1 to about 25 percent by weight of a second ligand compound L_2 and (iii) a solvent for said copolymer, said (i) and said (ii), the weights of said (i) and (ii) being based on the weight of said copolymer and the weight ratio of (ii):(i) being from about 0.1:1 to about 20:1, wherein L_1 and L_2 may be the same or different ligand compounds which when x is 4, are phosphorus compounds selected from 5-phenyl-5H-dibenzophosphole and compounds of the formula $PR_1R_2R_3$ and when x is 3, are arsenic or antimony compounds of the formula $MR_1R_2R_3$ wherein M is arsenic or antimony, and wherein R_1, R_2 and R_3 may be the same or different and are selected from CH_3, C_2H_5, C_{6-10} aryl groups and C_{7-12} aralkyl groups.

4,464,516
PROCESS FOR PREPARING VINYL CHLORIDE POLYMERS

Karl Eberl, Burgkirchen; Manfred Engelmann, Burghausen, and Edgar Fischer, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 1, 1982, Ser. No. 445,966
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1981, 3149320
Int. Cl.³ C08F 2/00
U.S. Cl. 526—62 11 Claims

1. A process for preparing vinyl chloride homo-, co- or graft-polymers which contain at least 50% by weight, relative to the polymer, of polymerized vinyl chloride units, by polymerization of vinyl chloride, in the absence or presence of monomers which are copolymerizable with vinyl chloride, polymers which are graft-polymerizable with vinyl chloride, or mixtures thereof, in an aqueous dispersion in the presence of free radical-forming catalysts, and in the presence or absence of suspension stabilizers, emulsifiers and polymerization auxiliaries, in an apparatus those surfaces of which which can come into contact with the polymerization mixture or only with the isomers have been provided with a coating, wherein this coating is wholly or partially comprised of a reaction product which is obtained at −20° to +200° C., in the presence or absence of an aprotic solvent, by reacting

(a) at least one compound of the formula

$$R_n^I—Si—Z_{(4-n)} \quad (Ia)$$

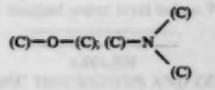
in which

Z denotes Cl, Br, —O—R_1, in which R_1 denotes an alkyl radical having 1 to 4 carbon atoms or —$OCOR_2$ in which R_2 denotes an alkyl radical having 1 to 4 carbon atoms,

n denotes 0 or 1, and the Z radicals can be identical or different, and

R^I denotes a hydrocarbon radical having 1 to 6 carbon atoms and carrying none, one or more of the following substituents:

F, Cl, Br, —SH, NH_2 or, if more than 1 or 2 carbon atoms are present, hetercatoms can be incorporated in its hydrocarbon chain as follows:



with the proviso that the radical R^I does not contain —SH or —NH_2 groups when at least one Z is Cl or Br,

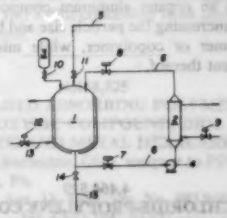
with

(b) at least one inhibitor for free-radical polymerizations which contains in the molecule at least one aromatic ring or at least one quinonoid ring and at least one hydrogen atom which is bonded to an oxygen, sulfur or nitrogen atom, then separating off excess compound (a) and, if present, the solvent, thereafter reacting the reaction product of the compounds mentioned, namely (a) and (b), with water at 10° to 100° C., under normal or elevated pressure in the presence or absence of a solvent which is at least partially miscible with water or of a catalyst, or of mixtures thereof, said catalyst being one which is known for the hydrolysis of silicon compounds and then treating the hydrolysis product at 40° to 200° C., in the presence or absence of a catalyst which is known for the crosslinking of hydrolyzed silicon compounds.

4,464,517
PROCESS FOR THE SUSPENSION POLYMERIZATION OF VINYL CHLORIDE

Tetsuya Makino; Masakatsu Itazawa, and Kenzi Ogura, all of Kurashiki, Japan, assignors to Ryo-Nichi Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 151,747, May 20, 1980, abandoned.
This application Oct. 31, 1981, Ser. No. 316,568
Claims priority, application Japan, May 25, 1979, 54-64650
Int. Cl.³ C08F 2/20
U.S. Cl. 526—88 9 Claims



1. In a process for the batchwise suspension polymerization of a reaction mixture comprising vinyl chloride, wherein the suspension polymerization of vinyl chloride, in the presence or absence of an ethylenically unsaturated monomer copolymerizable therewith, in an aqueous medium in the presence of a dispersing and an oil-soluble polymerization initiator is carried out in a polymerization reaction zone connected via a circulation line to an external cooling zone, the improvement wherein the volume ratio of the total monomer charge to the amount of water is kept at a level of more than 0.8 and the amount of said dispersing agent used is 0.03 to 0.1% by weight based on the total charge of the monomer, and circulation of the polymerization reaction mixture to the external cooling zone is initiated after the conversion of the monomer in the polymerization reaction mixture reaches at least 20% by weight, and

wherein an additional amount of the oil-soluble polymerization initiator is added to the polymerization reaction mixture after the initiation of its circulation, and

wherein during the circulation of the polymerization mix-

ture, the monomer is additionally added thereto thereby to maintain the volume ratio of the total monomer charge/-water at the range of 0.8 to 1.3.

4,464,518

PROCESS FOR THE POLYMERIZATION OR COPOLYMERIZATION OF ETHYLENE

Takeshi Iwabuchi; Hiroshi Morinaga; Masao Kawahara; Sakae Kamiyama; Terumi Sato, and Muneto Yokota, all of Ichihara, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Jun. 4, 1982, Ser. No. 385,314

Claims priority, application Japan, Jun. 24, 1981, 56-98055; Apr. 23, 1982, 57-67477

Int. Cl.³ C08F *4/02, 10/02*

U.S. Cl. 526—127 19 Claims

1. A process for the polymerization or copolymerization of ethylene which comprises polymerizing ethylene or a mixture of ethylene and other α-olefins in the presence of a catalyst system obtained by preparing a reaction product (A) of an organo aluminum compound (I) represented by the formula $AlR^1_nX_{3-n}$ where R^1 is hydrogen or an alkyl group having from 1 to 10 carbon atoms, X is Cl or Br and n is a number satisfying $0<n<3$, with a mixture of a straight chain aliphatic alcohol and a branched chain aliphatic alcohol or a cyclic alcohol, wherein the molar ratio of the straight chain aliphatic alcohol to the branched chain aliphatic alcohol or the cyclic alcohol is in the range of 10:1 to 1:10, separately preparing a reaction product (B) of an organo magnesium compound with a hydropolysiloxane or a silicone compound in which organic groups and hydroxyl groups are bonded to silicon atoms, reacting the reaction product (A) with the reaction product (B) at a temperature in the range of 70° to 170° C., to produce a reaction product (C), reacting the reaction product (C) with a halogen-containing titanium or vanadium compound to obtain a solid product (D) and bringing the solid product (D) in contact with an organo aluminum compound (II), thereby substantially increasing the particle size and bulk density of the formed polymer or copolymer, while minimizing the fine particle content thereof.

4,464,519

VINYL CHLORIDE-PROPYLENE COPOLYMERS HAVING INCREASED POROSITY

Phillip A. Mango, South Somerville, N.J., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 7, 1982, Ser. No. 386,147

Int. Cl.³ C08F *2/20, 214/06*

U.S. Cl. 526—200 4 Claims

1. In the suspension copolymerization of vinyl chloride and propylene, the method for producing vinyl chloride-propylene copolymer resin containing 88 to 99.8 wt% vinyl chloride and 0.2 to 12 wt% propylene and having improved porosity as demonstrated by an increased irreversible plasticizer take-up which method comprises conducting the suspension polymerization reaction using a suspension system comprising a hydroxypropylmethyl cellulose having 19–30% methoxyl and 4–12% hydroxypropoxyl substitution and a viscosity in the range of 30 to 60 cps as measured on a 2 wt% aqueous solution at 20° C., and a 30–50 mole % hydrolyzed polyvinyl alcohol, the hydroxypropylmethyl cellulose concentration is from 0.03 to 0.10 wt% and the polyvinyl alcohol concentration is from 0.01 to 0.10 wt%, based on monomer.

4,464,520

DELAYED CURE BISMALEIMIDE RESINS

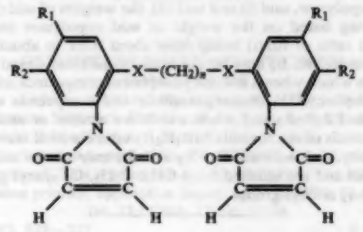
Johnnie E. Adams, Grandview, Mo., and Donald R. Jamieson, Merriam, Kans., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 12, 1982, Ser. No. 407,664

Int. Cl.³ C08F *122/40*

U.S. Cl. 526—262 4 Claims

1. A method for delayed curing of a bismaleimide, comprising: heating the bismaleimide to a temperature equal to or greater than its melting point but lower than the temperature at which it begins to polymerize; holding the melted bismaleimide at a temperature lower than that at which it begins to polymerize for a period of time sufficient to obtain a homogeneous melt; and then heating the bismaleimide to the temperature at which it polymerizes; said bismaleimide having the formula



wherein

R_1 and R_2 each independently is H, C_{1-4}-alkyl, C_{1-4}-alkoxy, Cl or Br, or

R_1 and R_2 together form a fused 6-membered hydrocarbon aromatic ring, with the proviso that R_1 and R_2 are not t-butyl or t-butoxy;

X is O, S or Se;

n is 1–3; and

the $-(CH_2)_n-$ group, optionally, is substituted by 1–3 methyl groups or by fluorine.

4,464,521

CURABLE COMPOSITION AND USE THEREOF

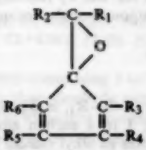
Bruce A. Gruber, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 300,788, Sep. 10, 1981, Pat. No. 4,390,675. This application Feb. 8, 1983, Ser. No. 464,843

Int. Cl.³ C08F *24/00*

U.S. Cl. 526—273 16 Claims

1. A composition which comprises a major amount of aggregate and an effective bonding amount up to about 40% by weight of the aggregate of the composition of a composition containing an epoxidized fulvene of the formula:



wherein each R_1 and R_2 individually is hydrogen or a hydrocarbon containing 1 to 10 carbon atoms, or a hydrocarbon containing one or more oxygen bridges in the chain; or a furyl group; or are interconnected to form a cyclic group, each R_3 and R_6 individually is hydrogen or methyl; each R_4 and R_5 individually is hydrogen or methyl or

provided that a maximum of only one such R_3, R_4, R_5, and R_6 is methyl; and provided that a maximum of any one such R_4 and R_5 is

or prepolymer thereof or mixtures thereof, wherein said prepolymer contains at least about 8% oxirane and a catalytic amount of an acid catalyst having a pKa of about 4 or less.

4,464,522

POLYMERS WITH PRIMARY AMINO GROUPS THEIR PREPARATION AND THEIR USE

Helmut Plum, Taunusstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

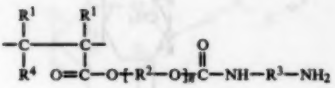
Filed Aug. 2, 1983, Ser. No. 519,554

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1982, 3229047

Int. Cl.³ C08F *120/36*

U.S. Cl. 526—301 **16 Claims**

1. A polymer which contains terminal amino groups and moieties of the formula (I)



(I)

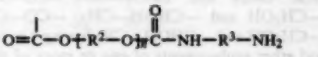
in which

R^1 is hydrogen or methyl,

R^2 is an aliphatic radical having 2 to 10 carbon atoms,

R^3 is an aliphatic radical having 3 to 19 carbon atoms, a cycloaliphatic radical having 4 to 15 carbon atoms or an aromatic radical having 6 to 13 carbon atoms,

R^4 is hydrogen or the radical



(II)

n is 1 to 10 and R^1 to R^4 are identical or different.

4,464,523

PROCESS FOR THE PREPARATION OF GRAFT COPOLYMERS OF CELLULOSE DERIVATIVES AND DIALLYL, DIALKYL AMMONIUM HALIDES

Dennis Neigel, Whitehouse Station, and John Kancylarz, Plainsboro, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed May 16, 1983, Ser. No. 495,015

Int. Cl.³ C08L *1/02, 1/08*

U.S. Cl. 527—300 **11 Claims**

1. A process for the preparation of graft copolymers of cellulose and cellulose derivatives and N,N-diallyl-N,N-dialkyl ammonium halide comprising the steps of:

(a) impregnating a concentrated aqueous solution of a N,N-diallyl-N,N-dialkyl ammonium halide, water soluble surfactant and catalyst, at a solids content of 50 to 70% by weight, onto a dry cellulose substrate;

(b) heating the reaction mass to about 60° to 85° C. and holding at that temperature, with agitation, for a period of 6 to 40 hours;

(c) adjusting the pH to 5 to 8; and

(d) drying to a residual water level below 7%.

4,464,524

POLYMERIC THICKENERS AND COATINGS CONTAINING SAME

Michael Karickhoff, Matteson, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Jul. 26, 1983, Ser. No. 517,494

Int. Cl.³ C08F *20/06;* **524** *558*

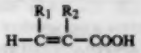
U.S. Cl. 526—313 **35 Claims**

1. A thickener consisting essentially of the free radical addition product obtained by the emulsion polymerization of:

(a) 3–15 parts styrene;

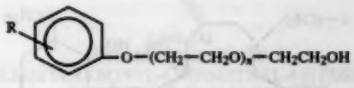
(b) 15–45 parts ethyl acrylate;

(c) 30–60 parts of at least one acid having the formula:



wherein R_1 and R_2 can be the same or different and are hydrogen or lower alkyl of 1 to about 3 carbons; and

(d) 10–25 parts of a mixture of esters; wherein the mixture of esters is the condensation reaction product of reactive amounts of (i) an ethylenically unsaturated cyclic carboxylic acid anhydride containing from 4 to about 8 carbon atoms; and (ii) an ethoxylated alcohol having the general formula:



wherein R is from one to three aliphatic radicals of 1 to about 30 carbon atoms each and n is an integer from about 6 to 150; and (iii) a diol containing from about 2 to about 10 carbon atoms.

4,464,525

NEAR INFRARED ABSORBING POLYMERIZATE, FROM DICARBOXYLIC COMPOUND, DIOL BIS(ALLYL CARBONATE) AND METAL HEXACARBONYL

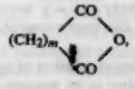
Jeffrey D. Vance, Barberton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 11, 1983, Ser. No. 483,966

Int. Cl.³ C08G *83/00*

U.S. Cl. 528—9 **8 Claims**

1. A solid near infrared absorbing polymerizate of (1) a member selected from the group consisting of (a) saturated aliphatic dicarboxylic acid having the formula, $HOOC—(CH_2)_n—COOH$, wherein n is an integer from 1 to 8, (b) aromatic dicarboxylic acid selected from the group consisting of phthalic acid, isophthalic acid and terephthalic acid, and (c) acid anhydrides selected from the group consisting of phthalic acid anhydride and acid anhydrides having the formula,



wherein m is 2 or 3, (2) diol bis(allyl carbonate), and (3) a near infrared absorbing amount of a metal hexacarbonyl selected from the group consisting of tungsten hexacarbonyl, molybdenum hexacarbonyl and vanadium hexacarbonyl, the acid or

anhydride of (1) being present in amounts sufficient to solubilize the metal hexacarbonyl.

4,464,526

PREPARATION OF POLYCAPROLACTONE

Herbert Mueller, Frankenthal, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 31, 1983, Ser. No. 499,355

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1982, 3221692

Int. Cl.³ G08G *63/10*

U.S. Cl. 528—358 **5 Claims**

1. A process for the preparation of polycaprolactone by polymerization of ε-caprolactone using a monohydric or polyhydric alcohol as an initiator, in the presence of a bleaching earth at from 50 to 160° C., wherein a mixture of caprolactone with a monohydric or polyhydric alcohol is passed over a fixed-bed catalyst comprising essentially anhydrous bleaching earth in the form of moldings.

4,464,527

ANTIBACTERIAL 9-DEOXO-9A-ALKYL-9A-AZA-9A-HOMOERYTHROMYCIN A DERIVATIVES AND INTERMEDIATES THEREFORE

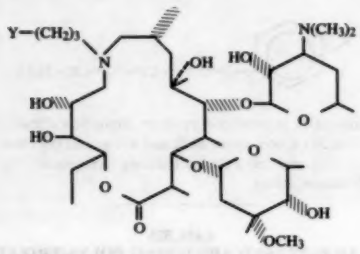
Gene M. Bright, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,538

Int. Cl.³ C07H *17/08*

U.S. Cl. 536—7.4 **5 Claims**

1. A compound having the formula



wherein Y is —NHCHO or

4,464,528

PROCESS FOR MAKING CATIONIC STARCH

Emmett L. Tasset, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 16, 1982, Ser. No. 450,328

Int. Cl.³ C08B *31/08, 31/12*

U.S. Cl. 536—50 **20 Claims**

1. In a process for making a cationic starch wherein a halohydrin quaternary amine compound is reacted with a starch in an alkaline aqueous slurry at a dry starch solids content of at least 40% by weight, the improvement which comprises the steps of:

(a) providing an aqueous solution of an alkali metal oxide or hydroxide as catalyst in an amount of from about 0.35 to about 1.2% based on the total weight of the reaction mixture,

(b) adding thereto said halohydrin quaternary amine compound.

(c) reacting by heating for a sufficient time to form the epoxide from said halohydrin compound,

(d) adding said starch to form a slurry in the reaction mixture,

(e) adding an alkaline earth metal oxide catalyst to said reaction mixture in an amount of from about 0.15 to about 0.8% based on the total weight of the reaction mixture,

(f) reacting by heating for a sufficient time to complete the cationization of the starch,

(g) cooling said reaction mixture,

(h) neutralizing by the addition of an acid,

(i) filtering, washing and recovering said cationic starch.

4,464,529

ANALOGUES OF MORPHOLINYL DAUNORUBICIN AND MORPHOLINYL DOXORUBICIN

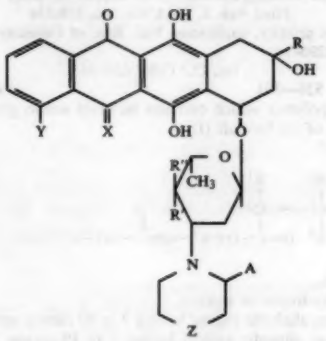
Carol W. Mosher, Stanford; George L. Tong, Cupertino, and Edward M. Acton, Menlo Park, all of Calif., assignors to SRI International, Menlo Park, Calif.

Continuation-in-part of Ser. No. 400,120, Jul. 20, 1982. This application May 24, 1983, Ser. No. 496,122

Int. Cl.³ C07H *15/24*

U.S. Cl. 536—6.4 **27 Claims**

1. A compound having the structure



wherein R is selected from —CO—CH_3, —CHOH—CH_3, —CO—CH_2OH, —CHOH—CH_2OH, hydroxy, 1 to 3 carbon alkyls, 1 to 3 carbon terminal hydroxyalkyls, 2 to 7 carbon organic acid esters and diesters of —CO—CH_2OH, —CHOH—CH_2OH and —CHOH—CH_3, —CO—CH_2OH, —CHOH—CH_2OH and —CHOH—CH_3 having 1 to 6 carbon alkyl or aryl ether replacements of one or more of their hydroxyls, and 13-ketimine derivatives of —CO—CH_3 and —CO—CH_2OH; Y is hydrogen or methoxy; X is =O or =NH, R′ and R″ together are a hydrogen plus a hydroxy, both are hydrogens or R′ is O-methoxy and R″ is hydrogen; A is hydrogen or cyano subject to the limitation that when X is =O, A must be cyano; Z is selected from oxygen, sulfur, —CH_2— and

wherein R‴ is a 1 to 3 carbon alkyl subject to the proviso that when Z is —CH_2— or

A is cyano.

4,464,530

PROCESS FOR PRODUCTION OF SUGAR KETALS

Koichi Matsumura, Ibaraki, and Tetsuya Aono, Nagaokakyo, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 23, 1983, Ser. No. 478,201
Claims priority, application Japan, Mar. 29, 1982, 57-50574
Int. Cl.³ C07H *1/00*
U.S. Cl. 536—124 **12 Claims**

1. A process for producing a sugar ketal which comprises reacting a sugar of the class consisting of the pentoses, hexoses, rhamnose, fucose, deoxyribose, deoxyglucose, ribitol, arabitol, mannitol, sorbitol and inositol with a ketone of the group consisting of di-(C^{1-3}-alkyl)ketones and C^{5-7}-cycloalkanones in the presence of hydrogen iodide.

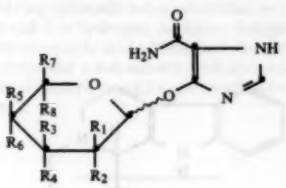
4,464,531

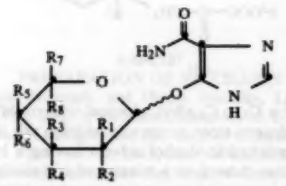
4-CARBAMOYLIMIDAZOLIUM-5-OLATE DERIVATIVES

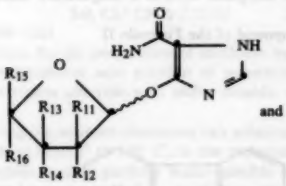
Toshio Atsumi, Kawanishi; Yuzo Tarumi, Nishinomiya; Tetsutaro Sanjiki, Ibaraki; Yoshiaki Takebayashi, Toyonaka, and Noboru Yoshida, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 7, 1982, Ser. No. 366,423
Claims priority, application Japan, Apr. 20, 1981, 56-59930; Feb. 12, 1982, 57-21632
Int. Cl.³ C07H *17/02*; A61K *31/70*
U.S. Cl. 536—17.4 **22 Claims**

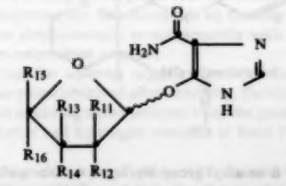
1. A compound selected from the group consisting of compounds of the formulae:







and



wherein one of R_1 and R_2 is selected from the group consisting of hydrogen, hydroxy, acyloxy, phthalimido and acetamido and the other is hydrogen; one of R_3 and R_4 is selected from the group consisting of hydroxy and acyloxy and the other is hydrogen; one of R_5 and R_6 is selected from the group consisting of hydroxy and acyloxy and the other is hydrogen; one of R_7 and R_8 is selected from the group consisting of hydrogen, methyl, hydroxymethyl, acyloxymethyl, alkoxycarbonyl of 1 to 4 carbon atoms in the alkoxy group, a group of the formula:

(wherein X_1 and X_2 are selected from the group consisting of hydrogen and alkyl of 1 to 6 carbon atoms) and carboxyl and the other is hydrogen; one of R_{11} and R_{12} is selected from the group consisting of hydrogen, hydroxy and acyloxy and the other is hydrogen; one of R_{13} and R_{14} is selected from the group consisting of hydroxy and acyloxy and the other is hydrogen; one of R_{15} and R_{16} is selected from the group consisting of methyl, hydroxymethyl and acyloxymethyl and the other is hydrogen,

wherein all of said acyloxy groups, including the acyloxy groups of said acyloxymethyl groups, are selected from the group consisting of alkanoyloxy of 2 to 7 carbon atoms and benzoyloxy, said benzoyloxy being unsubstituted or substituted by a member selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, nitro and halogen.

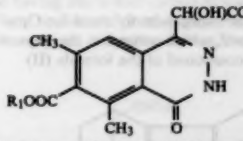
4,464,532

INTERMEDIATES OF 7-ALKOXYCARBONYL-6,8-DIMETHYL-4-HYDROXYMETHYL-1-PHTHALAZONE

Yukio Takei, Abiko; Masao Yoshida, and Rinzo Nishizawa, both of Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Japan

Division of Ser. No. 171,363, Jul. 23, 1980, Pat. No. 4,350,813. This application Jun. 7, 1982, Ser. No. 386,001
Claims priority, application Japan, Jul. 31, 1979, 54-96763; Jul. 31, 1979, 54-96764
Int. Cl.³ C07D *237/32*
U.S. Cl. 544—237 **2 Claims**

1. 7-alkoxycarbonyl-6, 8-dimethyl-1-phthalazone-4-α-hydroxyacetic acid represented by the following formula



wherein R_1 is a lower alkyl, or a salt thereof.

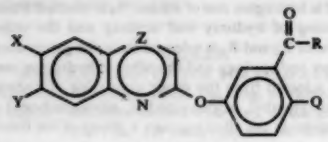
4,464,533

HERBICIDALLY ACTIVE QUINOLINE OR QUINOXALINE BENZOATE DERIVATIVES

Dennis K. Krass, Canal Fulton, and Sidney B. Richter, Fairlawn, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 8, 1982, Ser. No. 440,053
Int. Cl.³ C07D *241/44, 215/22*; A01N *43/60, 43/38*
U.S. Cl. 544—354 **4 Claims**

1. A compound of the formula:



wherein:

Q is halogen, nitro, or cyano;

X and Y are the same or different and represent hydrogen, halogen, alkyl or haloalkyl of up to 4 carbon atoms;

Z is nitrogen; and

R is —OH, —OM, —OR^1, —SR^1 or —NR^2R^3 wherein M is an agronomically suitable salt (e.g., sodium, potassium or ammonium);

R^1 is C_1 to C_{12} alkyl optionally monosubstituted by hydroxy or C_1 to C_{12} alkoxy, —R^4COOR^5, wherein R^4 is C_1 to C_3 alkylene optionally monosubstituted by C_1 to C_4 alkyl and R^5 is hydrogen, C_1 to C_{10} alkyl or an agronomically suitable salt;

R_2 is hydrogen, C_1 to C_{12} alkyl or C_3 to C_{12} alkenyl;

R_3 is hydrogen C_1 to C_{12} alkyl, C_3 to C_{12} alkenyl, C_1 to C_6 alkoxy, C_2 to C_6 alkyl carbonyl or C_1 to C_6 alkane sulfonyl.

4,464,534

PROCESS FOR THE PREPARATION OF VINCAMINIC ACID ESTERS

Csaba Szántay; Lajos Szabó; György Kalaus; János Kreidl; András Nemes; Maria Farkas née Kirják; György Visky, and László Czibula, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Sep. 28, 1982, Ser. No. 425,866

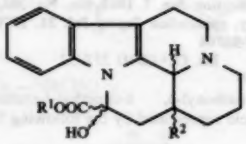
Claims priority, application Hungary, Sep. 30, 1981, 2812/81

Int. Cl.³ C07D *461/00, 455/00*

U.S. Cl. 546—51 **13 Claims**

1. A process for the preparation of a racemic or optically active compound of the formula (I)

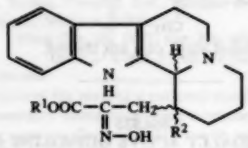
(I)



wherein R^1 and R^2 independently stand for C_1 to C_6 alkyl, or a 14-epimer thereof, which comprises the steps of

(a) reacting a compound of the formula (II)

(II)



with an aqueous solution of sulfurous acid or a salt thereof at a temperature of 80° to 100° C. to form a mixture of the compound of the formula (I) and its 14-epimer; and

(b) epimerizing the mixture formed in step (a) to yield the compound of the formula (I) or separating out the 14-epimer from the compound of the formula (I) to obtain the desired product.

4,464,535

PROCESS FOR THE PREPARATION OF EBURNAMONINE DERIVATIVES

Csaba Szantay; Lajos Szabo; György Kalaus; János Kreidl; György Visky; András Nemes; László Czibula, and Mária Farkas nee Kirják, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Nov. 1, 1982, Ser. No. 438,288

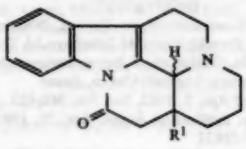
Claims priority, application Hungary, Mar. 11, 1981, 3274/81

Int. Cl.³ C07D *461/00, 455/00*

U.S. Cl. 546—51 **4 Claims**

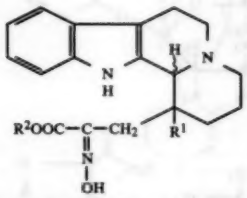
1. A process for the preparation of a compound of the Formula I

(I)



wherein R^1 is C_1 to C_6 alkyl, or an optical or geometric isomer thereof, which comprises the step of cyclizing a compound of the Formula II

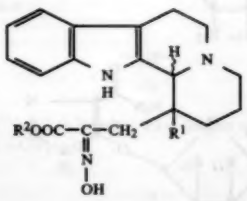
(II)



wherein R^2 is C_1 to C_6 alkyl, identical with or different from R^1 or a hydrogen atom, or an acid addition salt thereof, in a mono- or polyhydric alcohol solvent having a high boiling point, an ether thereof, or a mixture of said alcohol and said ether, in an inorganic base, at a temperature between 60° C. and 200° C.

4. A compound of the Formula II

(II)



wherein R^1 is an alkyl group having 1–6 carbon atoms and R^2 is hydrogen or a salt, stereoisomer or geometrical isomer thereof.

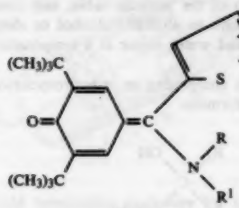
4,464,536

ENAMINES, PHARMACEUTICAL COMPOSITIONS, METHODS, SYNTHETIC PROCESSES AND INTERMEDIATES

Robert A. Scherrer, White Bear Lake, and George G. I. Moore, St. Joseph, both of Wis., assignors to Riker Laboratories, Inc., St. Paul, Minn.

Filed Nov. 5, 1982, Ser. No. 439,613
Int. Cl.³ C07D *417/06*
U.S. Cl. 546—213 16 Claims

1. A compound of the formula



wherein R is lower alkyl; R^1 is selected from the group consisting of lower alkyl, benzyl and 2-(N,N-dimethylamino)ethyl; or R and R^1 are fused to form a five- or six-membered heterocyclic ring selected from the group consisting of pyrrolidinyl, piperidinyl, piperazinyl, N-lower alkyl piperazinyl, prolyl, morpholinyl, thiomorpholinyl, pyrrolyl, imidazolyl, and pyrazolyl, said ring optionally being substituted by a lower alkyl substituent; and X is hydrogen, methyl or halogen; or a pharmaceutically acceptable acid addition salt thereof.

7. The compound 2,6-di-tert-butyl-4-[(alpha-(1-piperidino)-alpha-2-thienyl]methylidene-2,5-cyclohexadien-1-one according to claim 1.

4,464,537

PREPARATION OF SACCHARIN

Peter Tonne, Neustadt, and Hagen Jaedicke, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,333
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1980, 3044112
Int. Cl.³ C07D *275/06*
U.S. Cl. 548—211 11 Claims

1. A process for the preparation of saccharin by reacting an aqueous hydrochloric acid solution of o-methoxy-carbonyl-benzenediazonium chloride with sulfur dioxide, which comprises:

(a) reacting the aqueous diazonium salt solution with sulfur dioxide at from 1° to 100° C., in the presence of a water-immiscible or only partially water-miscible inert organic solvent forming a two-phase reaction medium,

(b) decomposing the diazonium salt by treating the reaction mixture simultaneously or subsequently with a diazonium salt decomposition catalyst,

(c) treating the aqueous organic reaction mixture, or the organic phase obtained after removing the aqueous phase, with an oxidizing agent selected from the group consisting of chlorine and hydrogen peroxide at from 1° to 100° C., and

(d) reacting said organic phase with aqueous ammonia at from 0° to 50° C. and isolating the saccharin from the aqueous phase by acidifying with a strong acid.

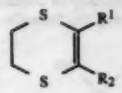
4,464,538

METHOD OF SYNTHESIZING DIHYDRO-1,4-DITHIINS

Arthur D. Brewer, Puslinch, Canada, assignor to Uniroyal Ltd., Don Mills, Canada

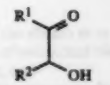
Filed May 3, 1983, Ser. No. 491,009
Claims priority, application Canada, May 6, 1982, 402400
Int. Cl.³ C07D *335/02*
U.S. Cl. 549—20 16 Claims

1. A method for making a dihydro-1,4-dithiin having the formula



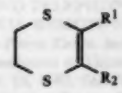
where R^1 and R^2 are hydrogen; the same or different aryl groups; alkyl having one to four carbon atoms; or R^1 and R^2 are joined to form a chain of 3 to 4 methylene groups by the reaction of an organic thiosulfate having the formula,

where M is a metal ion, with an acyloin having the formula



where R^1 and R^2 are as defined above.

4. A method for making a dihydro-1,4-dithiin having the formula



where R^1 and R^2 are hydrogen; the same or different aryl group, alkyl having one to four carbon atoms; or R^1 and R^2 are joined to form a chain of 3 to 4 methylene groups by the reaction of an organic thiosulfate having the formula,

where M is a metal ion, with a halocarbonyl compound, having the formula

where R^1 and R^2 are defined as above and X is a halogen atom.

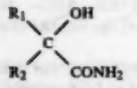
4,464,539

PROCESS FOR PRODUCING α,β-UNSATURATED CARBOXYLIC ACIDS OR ESTERS THEREOF

Masao Hashimoto, Yokohama, and Tadatoshi Honda, Fujisawa, both of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 311,600, Oct. 15, 1981, abandoned. This application Apr. 6, 1983, Ser. No. 480,779
Claims priority, application Japan, Oct. 16, 1980, 55-143591
Int. Cl.³ C07C 67/327, 67/20, 51/06, 51/377
U.S. Cl. 560—212 16 Claims

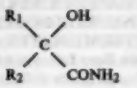
1. A process for producing an α,β-unsaturated carboxylic acid which consists essentially of contacting an α-hydroxycarboxylic acid amide having the formula:



(I)

wherein R_1 and R_2 each is a member selected from the group consisting of hydrogen and an alkyl group, with the proviso that at least one of R_1 and R_2 is an alkyl group, with a solid acid catalyst consisting essentially of at least one phosphate of an element selected from group III(b), the lanthanide group and the actinide group of the periodic table, said contact being carried out independently or along with water vapor at a temperature between 150° and 500° C.

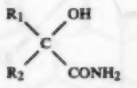
5. A process for producing an α,β-unsaturated carboxylic acid ester which consists essentially of contacting an α-hydroxycarboxylic acid amide having the formula:



(I)

wherein R_1 and R_2 each is a member selected from the group consisting of hydrogen and an alkyl group, with the proviso that at least one of R_1 and R_2 is an alkyl group, with a solid acid catalyst consisting essentially of at least one phosphate of an element selected from group III(b), the lanthanide group and the actinide group of the periodic table, said contact being arried out along with an aliphatic alcohol or along with an aliphatic alcohol and water vapor at a temperature between 150° and 500° C.

15. Composition comprising an α-hydroxycarboxylic acid amide having the formula:



(I)

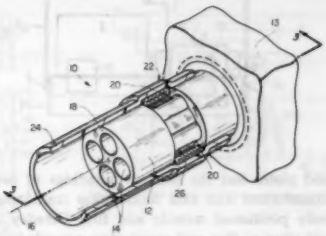
wherein R_1 and R_2 each is a member selected from the group consisting of hydrogen and an alkyl group, with the proviso that at least one of R_1 and R_2 is an alkyl group, with a first solid acid catalyst consisting essentially of at least one phosphate of an element selected from group III(b), the lanthanide group and the actinide group of the periodic table.

4,464,540

SHIELD TERMINATION ENCLOSURE WITH ACCESS MEANS AND SHIELD CONNECTION DEVICE

Larry R. Reeder, San Jose, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed May 19, 1982, Ser. No. 379,817
Int. Cl.³ H02G 15/068
U.S. Cl. 174—35 C 7 Claims



1. A shield termination enclosure for terminating one or more EMI shielded cables to be inserted therein and connected thereto, the enclosure comprising:

an electrically conductive body having a longitudinal axis and an outer periphery and having a plurality of openings extending therethrough, the openings being substantially parallel to said axis and each opening having a corresponding access means for accessing the opening, each access means comprising a groove in the outer periphery of the body which defines means for inspecting the EMI cable shield within the opening and for inspecting a joint formed between the body and the EMI cable shield, said openings capable of receiving EMI cable shield to be inserted within the openings and said access means allowing the flow of fixable electrically conductive material to connect cable shield to the body and to block radiated EMI from passing through the openings.

4,464,541

FLAME RETARDANT PREINSULATED ELECTRICAL CONNECTOR

Myron Ceresa, Advance; Frank N. Vyas, Winston-Salem, and Richard H. Zimmerman, Kernersville, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 21, 1983, Ser. No. 477,472
Int. Cl.³ H01R 4/20
U.S. Cl. 174—84 C 6 Claims

1. A preinsulated crimpable ferrule type electrical connector comprised of an insulated sheath partially surrounding a ferrule, the insulated sheath being characterized in that:

the sheath is a two layer laminate comprised of a paperlike layer of a heat resistant thermosetting polyamide that will not melt and flow when subjected to fire bonded to a layer of tetrafluoroethylene film,

the polyamide layer is the inner layer of the sheath and is against the ferrule to promote adhesion of the laminate to the ferrule, and

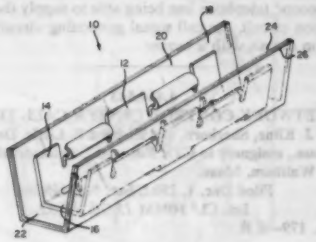
the tetrafluoroethylene layer is the outer layer of the sheath, whereby

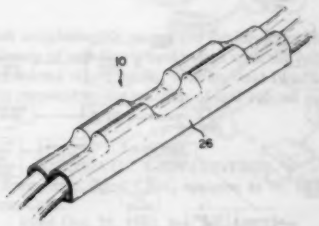
upon crimping onto wires the polyamide layer provides support for the tetrafluoroethylene layer as the sheath follows the ferrule thus escasing the polyamide layer inside the tetrafluoroethylene layer.

6. A method for manufacturing a strip of preinsulated crimpable ferrule type electrical connectors, the connectors being comprised of an insulating sheath partially surrounding a ferrule, the method being characterized in that the steps include:

adhering a strip of insulating sheath comprised of a layer of tetrafluoroethylene bonded to a layer of heat resistant aromatic thermosetting polyamide to a strip of essentially flat connector blanks, whereby the polyamide layer will not melt and flow when subjected to fire,

positioning the blanks on the polyamide layer so that the sheath extends beyond the ends of the ferrule, whereby the polyamide layer promotes adhesion of the laminate to the ferrule





removing portions of the sheath strip and connector strips to form a ladder strip of individual blanks attached to carrier strips of the sheath, and

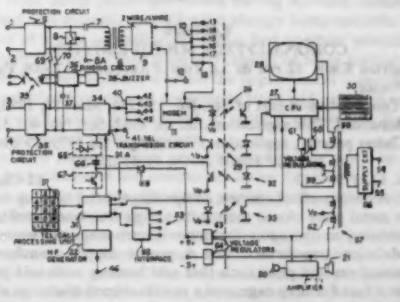
forming the blanks into connectors having the insulated sides of the connectors extending upwards from the plane of the strip.

4,464,542

MULTIFUNCTIONAL COMMUNICATION TERMINAL CONNECTED TO TWO TELEPHONE LINES AND WITH PARTIAL REMOTE SUPPLY

Michel Baudoin; Jean-Pierre Carru, and Yves Veislinger, all of Colombes, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 13, 1982, Ser. No. 449,279
Claims priority, application France, Dec. 18, 1981, 81 23726
Int. Cl.³ H04M 11/06
U.S. Cl. 179—2 C 3 Claims



1. A multifunctional communication terminal connected to two telephone lines and which is normally supplied with

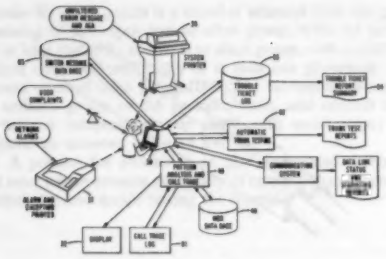
power by power mains, which comprises a data display means controlled by a central processing unit cooperating with a data introduction keyboard, wherein said terminal is connected by a modem to the first of said two telephone lines and to a circuit for generating telephone call signals cooperating with a number dialling keyboard and connected to the second telephone line by an electronic telephone transmission circuit, the current of the second telephone line being able to supply the telephone transission circuit, the call signal generating circuit and a call detection circuit with a buzzer.

4,464,543

NETWORK CONTROL CENTER CALL TRACE

Samuel J. Kline, Sherborn, and Richard E. Little, Dedham, both of Mass., assignors to GTE Business Communication Systems Inc., Waltham, Mass.

Filed Dec. 1, 1982, Ser. No. 445,866
Int. Cl.³ H04M *15/26, 15/32*
U.S. Cl. 179—8 R **15 Claims**



1. In a telecommunication system having a plurality of tandem node switches interconnected by a plurality of trunks and a network control center, a call trace system for identifying the circuit path taken from a calling number to a called number, comprised of:

means associated with each tandem node switch to transmit message detail records, including calling or called number, incoming or outgoing trunks or circuits, date, time, and disposition of call, to the network control center;

means to store message detail records in a database;

means for searching said database for message detail records pertaining to the calling number or the called number during a time period;

means for listing the pertinent message detail records found in the search; and

means to translate said message detail records into a graphical representation of the route the searched call took as it passed through network.

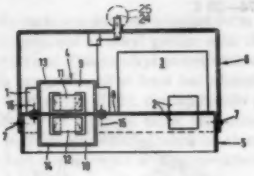
4,464,544

CORONA-EFFECT SOUND EMITTER

Siegfried Klein, 42 rue de La Tour-d'Auvegne, F-75009 Paris, France

Continuation-in-part of Ser. No. 132,231, Mar. 31, 1980, abandoned. This application Jul. 23, 1982, Ser. No. 401,323
Claims priority, application France, Apr. 13, 1979, 79 09448
Int. Cl.³ H04R *23/00*; H01F *27/30*
U.S. Cl. 179—113 **12 Claims**

1. A corona-effect emitter, comprising a metal housing and a thin metal plate closed therewith; a high frequency oscillator generating in operation disruptive electro-magnetic waves, a modulation transformer, and a power supply transformer mounted on said plate such that said housing with said plate form a first Faraday cage; and a needle-shaped discharge electrode having a tip and being electrically connected to said high frequency oscillator and producing corona discharge and a counter electrode spaced from the discharge electrode and surrounding the latter, said counter electrode forming a second Faraday cage around said tip, said modulation transformer and said power supply transformer each having a primary winding and a secondary winding, the secondary windings of said power supply transformer and said modulation transformer being respectively positioned inside the first Faraday cage and



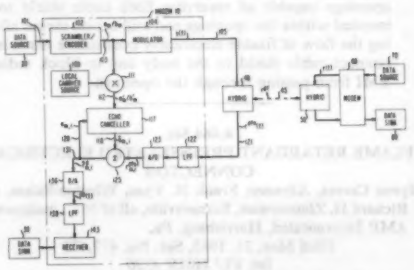
above said plate, and the primary windings of said power supply transformer and said modulation transformer being respectively positioned outside said first Faraday cage and below said plate so that said metal plate extends between the secondary windings and primary windings of the respective transformers.

4,464,545

ECHO CANCELLER

Jean J. Werner, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 13, 1981, Ser. No. 282,669
Int. Cl.³ H04B *3/20*
U.S. Cl. 179—170.2 **14 Claims**



1. Echo cancellation apparatus for use in conjunction with circuitry adapted to transmit a double sideband-quadrature carrier signal representing a stream of complex data symbols occurring at a rate of 1/T, said circuitry being further adapted to receive a signal which includes at least a first echo of said transmitted signal, said echo cancellation apparatus comprising

means for forming at least a first echo replica sample during each of a succession of T second intervals, each echo replica sample being formed by forming, in response to signals equal to the real and imaginary components of said complex data symbols, a weighted sum of rotated versions of said real and imaginary components, the weighted sum formed during any particular one of said T second intervals being a function of the sum of the products of each said rotated version with a respective one of and ensemble of coefficients associated with said one of said intervals,

means for combining each of the echo replica samples with a respective sample of said received signal to form a plurality of echo compensated samples, and

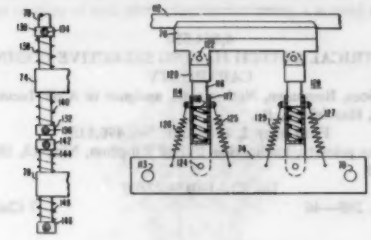
means for determining the values of said coefficients in response to at least ones of said echo compensated samples and at least ones of said rotated versions.

4,464,546

POWER COLLECTION APPARATUS FOR A VEHICLE

Frank R. Culver, McMurray, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 23, 1981, Ser. No. 324,296
Int. Cl.³ B60L *5/36, 5/39*
U.S. Cl. 191—49 **4 Claims**



1. In power collection apparatus for a vehicle having an electrical load and movable along a support track having at least one electrically energized power rail extending substantially in parallel with said support track, the combination of:

means carried by said vehicle and electrically coupled with said one power rail for collecting power to energize said vehicle load,

means connected between the vehicle and said power collecting means for enabling the power collecting means to maintain an electrical coupling with different positions of said one power rail as the vehicle moves along the support track, with said enabling means including first support means to control the collecting means to follow vertical position changes of the one power rail in relation to said vehicle and along a first axis of movement, including second support means controlling the collecting means to follow horizontal position changes of the one power rail in relation to said vehicle and along a second axis of movement substantially perpendicular with said track, and including third support means to control the collecting means to follow horizontal position changes of the one power rail in relation to said vehicle and along a third axis of movement substantially parallel with said track, and

with said third support means providing one of a normal position and a restrained position for the power collecting means, such that the power collecting means in the restrained position is moved along said third axis of movement in relation to said vehicle.

4,464,547

TAP CHANGING MECHANISM

Ali A. Ghafourian, Zanesville, Ohio, assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Sep. 3, 1982, Ser. No. 414,872
Int. Cl.³ H01H *3/00*
U.S. Cl. 200—17 R **16 Claims**

1. Apparatus, comprising:

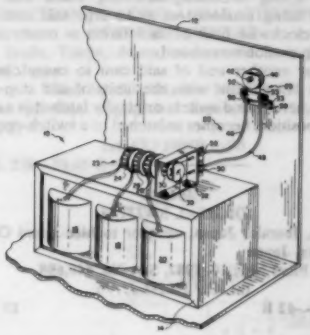
a. an electrical switch having a plurality of contacts, a first shaft, and means for electrically connecting together preselected contacts in response to the rotation of said first shaft in one direction, the rotation of said first shaft in the opposite direction having the effect of electrically disconnecting said contacts from each other;

b. a base for supporting said switch;

c. a second shaft rotatably carried by said base, and disposed at an angle relative to said first shaft;

d. first wheel means, carried by said first shaft, for rotating said first shaft, said first wheel means defining two radially disposed arms the lengths of which are greater than the radius of said shaft;

e. second wheel means, carried by said second shaft and defining two radially disposed arms the lengths of which are greater than the radius of said second shaft, for amplifying the arc length through which said second shaft is rotated; and



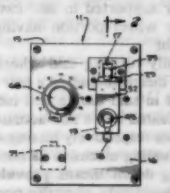
f. conduit coupled cable means for flexibly connecting the radial arms of said first wheel means with the radial arms of said second wheel means, whereby said switch is operated in response to the rotation of said second shaft.

4,464,548

AUTOMATIC KILN CONTROL

Lewis H. Burmeister, Brea, Calif., assignor to W. P. Dawson, Inc., Brea, Calif.

Filed Oct. 25, 1982, Ser. No. 436,325
Int. Cl.³ H01H *43/00*
U.S. Cl. 200—33 R **4 Claims**



1. An improved device for interrupting an electric circuit for supplying electric power to the heating elements of a kiln of the type having a ceramic switch mounted on the rear surface of a front cover plate, said switch having movable contacts located on a movable spring loaded plunger being operable by means of a post accessible through a first aperture provided through said front cover plate and capable of being latched in a switch-closed position wherein the improvement comprises:

a modified locking cam operable to latch said switch in said switch-closed position and to unlatch said switch from said switch-closed position;

said cam having a pivot permitting rotation of said cam in both clockwise and counterclockwise directions;

a stop-motion screw that limits said clockwise and counterclockwise rotations of said cam;

a second aperture through said cam in registry with said first aperture provided through said front cover plate;

a flat portion substantially below said second aperture and near one end of said cam responsive to an upwardly applied force so as to rotate said cam in said clockwise direction whereby said switch, originally latched in a switch-closed position, becomes unlatched to a switch-open position;

a hair spring assembly including a spring and having first and second spring tensioning fastening means;

a spring retaining member of said cam having a spring retaining opening operable to accept said spring having first and second spring tensioning fastening mens, said spring thereby being tensioned so as to urge said cam to the counterclockwise limit of its rotation as constrained by said stop-motion screw; and

means near another end of said cam to cause clockwise rotation of said cam witin the limits of said stop-motion screw whereby said switch, originally latched in a switch-closed position, becomes unlatched to a switch-open position.

4,464,549

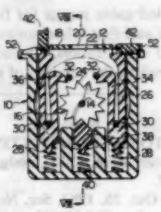
DIGITAL SWITCH

Teizo Fujita, Ibaraki, Japan, assignor to Idec Izumi Corporation, Osaka, Japan

Filed Nov. 10, 1982, Ser. No. 440,698

Int. Cl.³ H01H *21/76*

U.S. Cl. 200—42 R **17 Claims**



1. A digital switch comprising:

a casing;

a wheel rotatably supported in said casing, said wheel including a gear wheel portion having a predetermined number of teeth;

means for manually rotating said wheel step by step, said wheel rotating means including a pair of actuating means each supported in said casing and individually movably between an actuated and a non-actuated position;

a pair of bias means respectively biasing an associated one of said pair of actuating means to its non-actuated position;

a pair of pushing-down means provided outside of said casing each respectively pivotally coupled with a corresponding one of said pair of actuating means through a corresponding one of a pair of apertures in a wall portion of said casing so that each of said pushing-down means is manually movable between a non-actuating position and an actuating position in which said corresponding one of said pair of actuating means can be pushed down to said actuated position against said associated one of said pair of bias means, each of said pair of actuating means having a finger means which cannot engage said gear wheel portion when said actuating means is in its non-actuated position but which does engage a specific one of the teeth of said gear wheel portion so as to rotate said gear wheel portion and therefore said wheel by one step in a predetermined rotary direction when said actuating means is brought into its actuated position from its non-actuated position;

an electrical contact carried by said wheel;

electrical circuit means attached to said casing and provided with a plurality of electrical contacts which are successively touched by said electrical contact carried by said wheel when said wheel is rotated step by step for producing an electrical signal in accordance with a stepping rotary position of said wheel; and

locking means for disabling said wheel rotating means, said locking means including a pair of engaging means for each of said pair of pushing-down means, one of said pair of engaging means being provided on a wall portion of said casing and the other of said pair of engaging means being provided on said pushing-down means so that said pair of engaging means engage with each other when said pushing-down means is in its non-actuating position so as to disable said pushing-down means by preventing its free movement unless said pushing-down means is manually brought into its actuating position.

4,464,550

ELECTRICAL SWITCH HAVING SELECTIVE CODING CAPABILITY

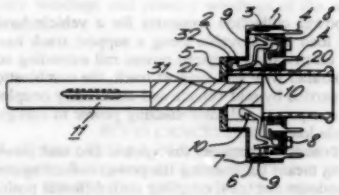
Lucas Soes, Rosmalen, Netherlands, assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 2, 1983, Ser. No. 490,815

Claims priority, application United Kingdom, May 13, 1982, 8213890

Int. Cl.³ H01H *27/00*

U.S. Cl. 200—46 **7 Claims**



1. An electrical switch comprising a plurality of resilient contacts mounted on an insulating base in an array about a hole in the base, a plurality of fixed contacts mounted on the base and respectively associated with the resilient contacts, a cover enclosing the resilient and fixed contacts on the base, the cover having a cover hole which is in alignment with the hole in the base, and a coding key receivable in the hole in the base and in the cover hole, the key having radially extending ribs, the cover having slots extending radially from the cover hole, the base having slots extending radially from the hole in the base, the slots in the cover and in the base being dimensioned to receive the ribs so that the key can be received only in a particular orientation, a plurality of removable actuator surfaces on the key respectively associated with the resilient contacts, the actuator surfaces being effective to engage the resilient contacts with the fixed contacts when the key is inserted into the hole in the base whereby upon removal of one of the actuator surfaces, the resilient contact associated with the removed actuator surface will not engage the associated fixed contact.

4,464,551

ELECTRIC CIRCUIT CONTROLLING DEVICE AND METHOD OF OPERATING SAME

Ronald L. Johnson, Prophetstown, Ill., assignor to General Electric Company, Fort Wayne, Ind.

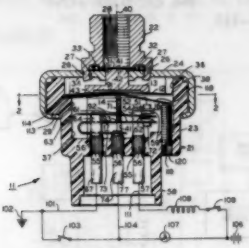
Filed May 14, 1982, Ser. No. 378,485

Int. Cl.³ H01H *35/34*

U.S. Cl. 200—83 P **27 Claims**

1. An electric circuit device comprising a housing having a fluid chamber and a switch chamber; a plurality of movable and fixed switch elements mounted in said switch chamber to define at least first and second switches each having selectively a closed and open circuit position; a snap acting member disposed in said housing for selectively operating said first and second switches; a switch actuator mounted for movement in said switch chamber with one section disposed in the vicinity of said snap acting member and another section in operative engagement with said movable switch elements of said first and second switches; and a piston movably carried in said

housing having one section in pressure receiving relation to said fluid chamber and having another section disposed in force transmitting relation to said snap acting member, said another section of said piston including a first angular region for applying a first preselected force at a first location on said snap acting member to effect snap acting movement thereof to operate said first switch through said switch actuator selectively between the closed and open circuit positions, said another section of said piston further including a second angular



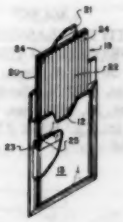
region formed in spaced relation to said first angular region for applying a second preselected force of greater magnitude than the first preselected force at a second location on said snap acting member spaced outwardly from the first location to produce snap acting movement thereof to operate said second switch through said switch actuator selectively between the closed and open circuit positions, whereby said snap acting member produces two discrete snap acting movements at different preselected force levels to attain selective operation of said at least first and second switches.

4,464,552

PACKAGING

Thomas D. Pawlowski, Neenah, Wis., assignor to James River-Dixie/Northern, Inc., Norwalk, Conn.

Filed Oct. 29, 1981, Ser. No. 316,135
Int. Cl.³ B65D *69/00*
U.S. Cl. 206—569 **5 Claims**



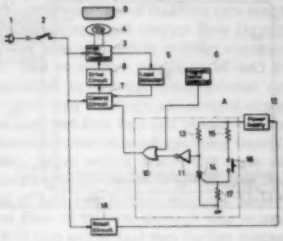
1. In an improved dispensing package, the combination of a pouch including an opening and a closure flap for folding over said opening, and a diabetic care test strip unit in said pouch and removable through said opening, said unit including a paperboard backing panel having a tab presented for grasping adjacent said opening, and a stack comprising at least two sheets of test material including sensitized paper, each sheet having a plurality of parallel knife cuts defining diabetic care test strips in orderly array, said sheets being attached to one another and to said backing panel in a region along an edge of said panel opposite the edge provided with said tab and having free ends in the region of said tab, said test strip unit being removable from said pouch, without handling said sensitized paper, by opening said closure flap, and grasping and pulling said tab to present the free end of a test strip for removal by tearing from said unit.

4,464,553

INDUCTION HEATING APPARATUS WITH AN OVERRIDE CIRCUIT

Tamon Ikeda, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 9, 1981, Ser. No. 281,657
Claims priority, application Japan, Jul. 19, 1980, 55-102255[U]
Int. Cl.³ H05B *6/06*
U.S. Cl. 219—10.49 R **15 Claims**



1. Induction heating apparatus comprising:

induction heating coil means for generating a time-varying magnetic field so as to heat an object;

AC signal supply means for supplying an AC signal to said induction heating coil means in response to the supply of power from a power source so as to control said induction heating coil means to generate said time-varying magnetic field;

means for connecting and interrupting said supply of power to said AC signal supply means;

magnetic detecting means for detecting whether said object is made of a ferromagnetic material and for producing a magnetic detecting output signal in response thereto;

control means for controlling said AC signal supply means in response to said magnetic detecting output signal so that said AC signal supply means supplies said AC signal to said induction heating coil means when said object is made of a ferromagnetic material;

switch means for supplying an override signal to said control means to cause the latter to control said AC signal supply means to supply said AC signal to said induction heating coil means regardless of whether said object is made of a ferromagnetic material; and

reset means for resetting said switch means in response to at least one of the connection and interruption of said supply of power to said AC signal supply means so that said switch means does not supply said override signal to said control means.

4,464,554

DYNAMIC BOTTOM FEED FOR MICROWAVE OVENS

Stephen M. Bakanowski, and Matthew S. Miller, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Aug. 25, 1982, Ser. No. 411,153
Int. Cl.³ H05B *9/06*
U.S. Cl. 219—10.55 F **13 Claims**

1. An excitation system for a microwave oven cooking cavity having electrically conductive walls, said excitation system promoting time-averaged uniformity of energy distribution and comprising:

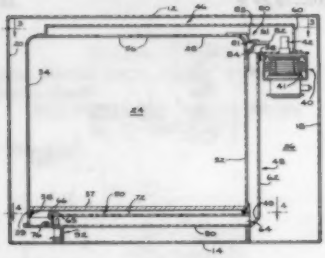
a source of microwave energy;

a hollow rectangular feed waveguide extending along one wall of the cooking cavity, said waveguide being coupled

at one end to said source of microwave energy to establish an electric field between opposing walls thereof, characterized by a standing wave field pattern;

means for periodically varying the termination of said waveguide between an open circuit termination and a closed circuit termination whereby the phase of the standing wave varies between a first phase relationship and a second phase relationship, respectively;

said waveguide including an array of radiating apertures spaced apart along the length thereof for feeding microwave energy into the cooking cavity; said array of apertures being arranged to support a first essentially station-



ary pattern of radiation in the cavity when said first phase relationship exists in said waveguide, and to support a second essentially stationary pattern of radiation in the cavity when said second phase relationship exists in said waveguide; each of said first and second radiating patterns being characterized by regions of relatively high energy density interspersed with regions of relatively low energy density, said second pattern being laterally displaced relative to said first pattern such that the regions of relatively high and low energy density of said second pattern substantially overlay the regions of relatively low and high energy density, respectively, of said first pattern.

4,464,555

TORCH, USEFUL IN AIR-CARBON ARC PROCESSES

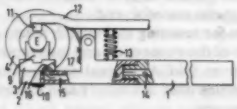
Roger Wallis, 42 Manor Park Dr., Sheffield 2, England

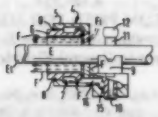
Filed May 11, 1982, Ser. No. 377,218

Claims priority, application United Kingdom, May 13, 1981, 8114635

Int. Cl.³ B23K *9/16, 9/28*

U.S. Cl. 219—69 R **7 Claims**





1. A torch comprising an elongate electrode having a tip, said electrode being mounted in a holder therefor, and means for providing a stream of gas at least to the tip of the electrode, gas control means to provide a substantially annular flow of gas along the electrode, said gas control means comprising a venturi-type injector means, and being arranged to supply to said electrode tip a flow of compressed gas and induced gas where the volume of the induced gas is several times greater than that of the compressed gas.

4,464,556

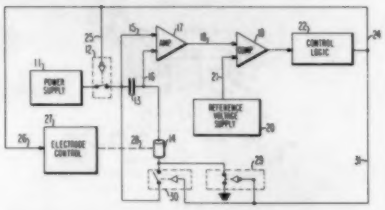
SYSTEM AND METHOD OF ACCURATELY CONTROLLING THE ELECTRODE VOLTAGE OF A WELDING DEVICE

Frank S. Krufka, Mount Joy, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 27, 1983, Ser. No. 508,261

Int. Cl.³ B23K *11/26*

U.S. Cl. 219—113 **6 Claims**



1. A system for controlling the voltage to the welding electrode of a welding device and to the part to be welded comprising

charge storage means electrically coupled to said electrode;

means for applying a voltage to said charge storage means through said electrode and said part to be welded;

sensing means for sensing the voltage directly across said charge storage means and providing a sensed signal representative of said voltage;

means for providing a reference voltage;

means responsive to said sensed signal and said reference voltage for providing a control signal when said sensed signal substantially equals said reference voltage; and

control means responsive to said control signal for discharging said charge storage means through said electrode and for inhibiting charging of said storage means during said discharging.

4,464,557

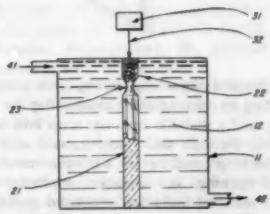
CRYSTAL GROWTH IN GLASSES AND AMORPHOUS SEMICONDUCTORS

Subhash H. Risbud, 301 E. Willard, Urbana, Ill. 61801, and Jainagesh A. Sekhar, 1502 N. Mattis, Champaign, Ill. 61820

Filed Nov. 23, 1981, Ser. No. 323,824

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LM **11 Claims**



1. A method of inducing crystal growth in a glassy material having a glass phase-crystal phase interface comprising the step of heating the interface by irradiation with a laser beam, said beam having a wavelength such that it is substantially transparent to one phase and substantially absorbed by the

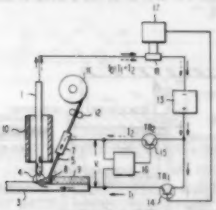
other phase and said beam having energy sufficient to effect said crystal growth at the interface; and the step of continuously cooling both phases to maintain them in the solid state during the crystal growth process.

4,464,558

HOT WIRE WELDING SYSTEM

Takaji Mizuno, and Takeo Shimizu, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1982, Ser. No. 391,766
Claims priority, application Japan, Jun. 25, 1981, 56-98752
Int. Cl.³ B23K 9/10
U.S. Cl. 219—130.21 **8 Claims**



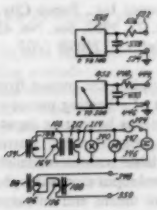
1. A hot wire welding system comprising;
a non-melting metal electrode;
means for supplying filler metal to a weld puddle formed by an arc between said electrode and a workpiece;
a single D.C. power source for supplying both an arc current forming an arc between said electrode and said workpiece and a filler metal heating current for heating said filler metal;
means for controlling said filler metal heating current such that a supply voltage between said filler metal and said workpiece is maintained substantially constant; and
means for controlling said arc current such that a total current equal to the sum of said arc current and said filler metal heating current flowing in said arc is substantially constant, said means for controlling said filler metal heating current comprising a first switching circuit and a first control circuit for controlling a switching state of said first switching circuit in response to said supply voltage.

4,464,559

PHASE-CONVERTING, VARIABLE OUTPUT, POWER SOURCE UTILIZING SCOTT CONNECTION

William J. Greene, Walterboro, S.C., assignor to Teledyne-Walterboro, a Divison of Teledyne Industries, Inc., Calif.

Filed May 3, 1982, Ser. No. 374,617
Int. Cl.³ B23K 9/10
U.S. Cl. 219—130.51 **20 Claims**



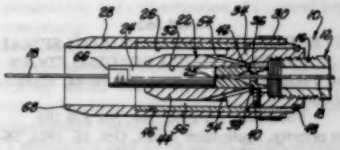
19. A phase-converting, variable-output, power source which is connectable to welding terminals and which converts A.C. of a given frequency into variable-amplitude A.C. having a different frequency and which comprises two magnetic amplifiers that are connected as part of one leg of a Scott connection, two further magnetic amplifiers that are connected as part of a further leg of said Scott connection, the first said two magnetic amplifiers having the primary windings thereof connected in series-aiding relation and having the secondary windings thereof connected in series-opposing relation to produce substantially no output voltage until at least one of the magnetic cores of said first two or of said two further magnetic amplifiers becomes saturated, said two further magnetic amplifiers having the primary windings thereof connected in series-aiding relating and having the secondary windings thereof connected in series-opposing relation to produce substantially no output voltage until at least one of the magnetic cores of said first two or of said two further magnetic amplifiers becomes saturated, a power rectifier connected in series relation with said secondary windings of said first two magnetic amplifiers to provide unidirectional current flow through said secondary windings, a second power rectifier connected in series relation with said secondary windings of said two further magnetic amplifiers to provide unidirectional current flow through said secondary windings, and control windings on said magnetic cores of said first two and of said two further magnetic amplifiers, said control windings being wound to provide magnetomotive forces which are in the same directions as magnetomotive forces developed in said magnetic cores of said first two and of said two further magnetic amplifiers by the unidirectional flow of current through said secondary windings of said first two and of said two further magnetic amplifiers, said first said two magnetic amplifiers developing time-spaced welding pulses, said two further magnetic amplifiers developing further time-spaced welding pulses, and circuit means interposing said further time-spaced welding pulses between the first said time-spaced welding pulses.

4,464,560

ARC WELDING GUN WITH GAS DIFFUSER AND EXTERNAL COOLING CONDUIT

John G. Church, Thornhill, and Emerson G. Malone, Rexdale, both of Canada, assignors to T.I.M.E. Welding Gas Corporation, Toronto, Canada

Filed Feb. 16, 1982, Ser. No. 349,141
Int. Cl.³ B23K 9/16
U.S. Cl. 219—137.42 **8 Claims**



1. A welding gun of the type having a rigid metal tubular member through which a welding wire element and shielding gas are adapted to pass, a metal gas diffuser member removably mounted upon one end of said tube member and having a major longitudinal axis, said diffuser member including a first tubular portion including a gas and welding wire receiving chamber in open communication with said tube member and which passage is coaxial with said major axis, a second tubular portion of a lesser diameter than said first portion and having a welding wire tip supporting opening therethrough and coaxially communicating with the passage in said first portion, a welding wire tip member removably mounted within the opening in the second tubular portion of the diffuser member and having an end projecting longitudinally beyond said second tubular portion, a welding wire opening formed coaxially through said welding wire tip member, a tubular nozzle supported at one end upon the first tubular portion of the diffuser member and having an open end projecting longitudinally

beyond said welding tip, said nozzle coacting with the second tubular portion of the diffuser member to define an annular gas chamber coaxial with the major axis of said diffuser member, a plurality of axially inclined passages formed in the tubular portions of the diffuser member to communicate the gas chamber of the first tubular diffuser portion with the annular gas chamber, and means for cooling said tubular member, said diffuser and said welding tip, the improvement comprising:

said passages being inclined to said major diffuser axis from 10° to 20°.

4,464,561

DEVELOPMENT UNIT FOR DRY SILVER RECORDING PAPER

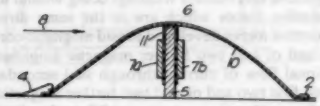
David K. Hulin, Bramley, England, assignor to Medellec Limited, London, England

Filed Mar. 3, 1982, Ser. No. 354,349

Claims priority, application United Kingdom, Mar. 3, 1981, 8106679

Int. Cl.³ H05B 1/00

U.S. Cl. 219—216 14 Claims



1. A developer unit apparatus for dry silver recording paper, which comprises a thin foil of thermally conductive material over the top surface of which the recording paper is passed; and a thermally conductive strip provided with at least one heating element, said strip being in thermal contact with the underside of said foil, wherein the region of thermal contact between said thermally conductive strip and the foil is substantially linear and is transverse to the direction of movement of the recording paper, wherein heating assemblies each including at least one heating element are provided on opposite faces of said thermally conductive strip, and wherein each heating assembly comprises two copper-track elements etched on a strip of epoxy glass fibre, said elements being separated by a thin copper plate and being sandwiched between two phosphor bronze strips.

4,464,562

ELECTRIC CURLING-IRON WITH SPIRAL POLYGONAL HAIR ENGAGING EDGES

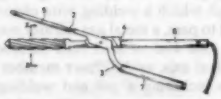
Toyosaku Takimae, 2-26, 2-chome, Takanawa, Minato-ku, Tokyo, Japan

Filed May 17, 1982, Ser. No. 379,159

Claims priority, application Japan, Oct. 16, 1981, 56-164088

Int. Cl.³ A45D 1/12; H05B 3/00

U.S. Cl. 219—225 4 Claims



1. In a curling iron for hair of the type constructed in the form of a scissors having one blade comprising an electrically heated rod and the other blade in the form of a clamp cooperating with said rod to press hair therebetween, the improvement comprising forming the surface of said rod with a plurality of side by side spiral polygonal edges, and said clamp is an arcuately shaped cover longitudinally coextensive with said rod and in contact with the edges of said rod, leaving a free space formed between said clamp and said rod when the hair is pressed between them.

4,464,563

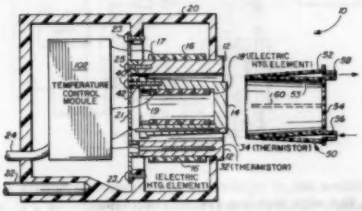
INTRAVENOUS FLUID WARMER

Warren R. Jewett, 2815 E. Fort Lowell, Tucson, Ariz. 85716

Filed Aug. 28, 1981, Ser. No. 297,423

Int. Cl.³ A61M 5/14; B67D 5/62; F24H 1/12; H05B 1/02

U.S. Cl. 219—298 21 Claims



6. A warmer module for warming a fluid comprising an elongated cylindrical outer heater, a concentrically located elongated cylindrical inner heater within said outer heater, and a temperature control assembly, said outer and inner heaters being so shaped as to define an elongated annular cylindrical tapering plenum therebetween, each of said outer and inner heaters including respectively, electrical heating elements attached thereto, and further including a separate temperature sensor attached to each of the outer elongated cylindrical heater and the inner elongated cylindrical heater; said temperature control assembly electrically connected to each of said inner and outer elongated cylindrical heater electrical heating element, and to each of the inner and outer elongated cylindrical heater temperature sensor, said temperature control assembly adapted to separately control the temperatures, respectively, of the inner and outer elongated cylindrical heaters simultaneously at two different temperatures in response to the temperature sensed by the sensor associated with each respective cylindrical heater.

4,464,564

CURRENT CONTROLLER FOR HEATING STAGE ON LEITZ MICROSCOPE

Wiley E. Zimmerman; Jimmy R. Alexander; Don E. Boles, all of Ponca City, Okla., and Rhea W. Bockhorst, Morgantown, W. Va., assignors to Conoco Inc., Ponca City, Okla.

Filed Oct. 27, 1982, Ser. No. 437,077

Int. Cl.³ H05B 1/02

U.S. Cl. 219—497 13 Claims

1. Apparatus for coupling the output from a programmable controller to the input of a heating means comprising:

(a) control circuit means having an input means coupled to the output of said programmable controller and an output;

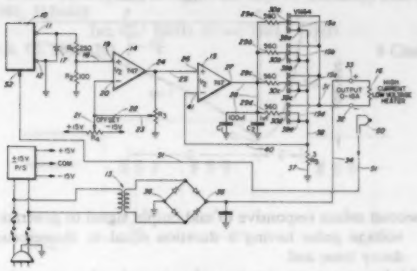
(b) controllable variable resistance transistor means having an electrical control input means coupled to said output of said control circuit means and an output which varies in resistance in accordance with a signal at its electrical control input means;

(c) current sensing means generating an output proportional to the current passing through the output of said controllable variable resistance means;

(d) means coupling a source of power through the input of

said heater means, through said controllable variable resistance means and through said current sensing means to said source of power; and

(e) means coupling the output from said current sensing means to said input means of said control circuit means,



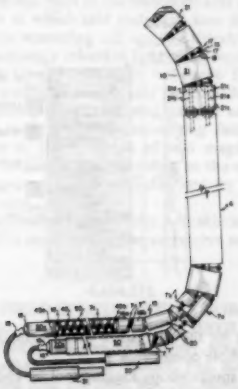
whereby an increase in signal output from said programmable controller will cause said control circuit means to reduce the resistance of said controllable variable resistance means causing said current sensing means to generate a response to the input means of said control circuit means balancing the input.

4,464,565

EXTENSIBLE TAPE HEATER

Glenn C. Spangler, 13645 Reeveston Rd., Houston, Tex. 77039

Filed Mar. 16, 1983, Ser. No. 475,732
Int. Cl.³ H05B *3/02*
U.S. Cl. 219—550 **1 Claim**



1. A tape heater for securing in close proximity to a surface including:

a. an elongated flexible resistance wire heating element;

b. heat transmitting extendable cover means generally coextensive with said element, said cover means being of electrically insulative material, wherein said resistance wire heating element is a continuous wire that extends from one end of said cover means to the other end and then doubles back on itself to said one end of said cover means wherein;

c. substantially nonresistive wire means connected about one end of said element;

d. spring means surrounding said nonresistive wire means and abutting said cover means at one of its ends, wherein said cover means comprises a plurality of ceramic beads strung in end to end relation on said wire whereby compression of said spring means enables said beads to spread apart so that the heater may be secured in close proximity to a surface of varying diameter and configuration without changing the length of said element and without removing any of said beads;

e. stop means positioned on said nonresistive wire means in spaced relation to the end of said cover means which abuts one end of said spring means;

f. said spring means having its other end in abutting relationship with said stop means; and

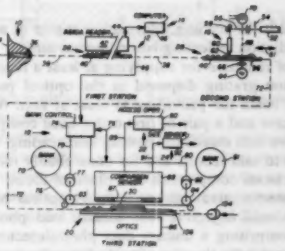
g. flexible sleeve means extending over said spring means and fastened about said cover means.

4,464,566

ACCESS SECURITY CONTROL

Daniel Silverman, 5969 S. Birmingham Ave., Tulsa, Okla. 74105, and Everett A. Johnson, 15 S. Prospect Ave., Park Ridge, Ill. 60068

Continuation of Ser. No. 233,885, Feb. 12, 1981, Pat. No. 4,395,628, which is a continuation of Ser. No. 32,404, Apr. 23, 1979, Pat. No. 4,303,852, which is a continuation-in-part of Ser. No. 752,912, Dec. 21, 1976, Pat. No. 4,150,781, which is a continuation-in-part of Ser. No. 495,632, Aug. 8, 1975, Pat. No. 3,999,042, which is a continuation-in-part of Ser. No. 272,739, Jul. 18, 1972, Pat. No. 3,829,661, which is a continuation-in-part of Ser. No. 74,066, Sep. 21, 1970, Pat. No. 3,677,465. This application Sep. 29, 1982, Ser. No. 427,588
Int. Cl.³ G06K *5/00*
U.S. Cl. 235—382 **9 Claims**



1. A system for access control, for selectivley granting access on presentation and authentication of a control token, said system comprising:

A. a bank comprising

(1) storage means for storing a plurality of unique authenticating master coded bit patterns, each in different address locations; said coded bit patterns comprising magnetically altered areas;

(2) a plurality of address locations in said storage means, each address being an index of the bit pattern stored therein; and

(3) means to produce a plurality of unique bit patterns;

B. a plurality of control tokens, each control token comprising

(1) an unique object;

(2) means on said object for storing in machine readable form an unique index;

(3) means on said object for storing in machine readable and machine writeable form an unique coded bit pattern;

(4) each of said control tokens having one of said unique indicia and the corresponding unique authenticating coded bit patterns stored in said bank;

C. reading means to which a control token can be presented, said reading means including first means to read said indicium, and second means to read said coded bit pattern on said token;

D. means responsive to said first means to select from said

bank said coded bit pattern corresponding to said indicium;

E. means to compare the unique bit pattern read from said token with the stored bit pattern in said bank corresponding to the read indicium, and

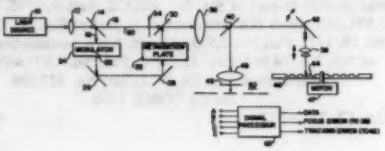
F. means responsive to said comparison means to select a different unique bit pattern from said means to produce, and to write a new unique bit pattern on said token and in said bank in an address corresponding to said indicium on said token.

4,464,567

PHOTOELECTRIC INFORMATION AND FOCUS DETECTOR

Charles Reilly; Leonard Laub, both of Pasadena, and Krishna Swaminathan, Santa Monica, all of Calif., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Jun. 30, 1981, Ser. No. 279,101
Int. Cl.³ G01J 1/36
U.S. Cl. 250—204 **9 Claims**



1. Apparatus for reading information stored in a track pattern on a radiation reflecting record comprising:

a source of radiation for supplying at least a reading beam;

a diffraction grating disposed in the optical path of said reading beam for providing at least at zero order beam component and a pair of first order bean components;

an objective lens means for passing said reading beam components to said record and for controllably focusing said reading beam components at a plane of focus;

a photodetector array disposed in an optical path which includes said objective lens means, said photodetector array comprising a unitary data photodetector disposed for impingement thereon of said zero order reading beam component for sensing said stored information and at least first and second paired photodetector arrays adjacent to said data photodetector, said paired photodetector arrays including separated sectors disposed along an axis including said data photodetector for sensing relative differences of said first order beams impinging on said sectors of each pair to provide at least focus error correction signals to said objective lens means; and

means provided in the optical path between the focal plane of said objective lens means and said photodetector array for providing a first portion of said reading beam components which has a minimum size greater than the separation between the ones of said pairs of photodetectors and a second portion of said reading beam components which varies substantially linearly in size as said record deivates from said plane of focus.

4,464,568

APPARATUS FOR DETECTION AND ANALYSIS OF URANIUM ORES

Graydon L. Brown, and Larry L. Newlin, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

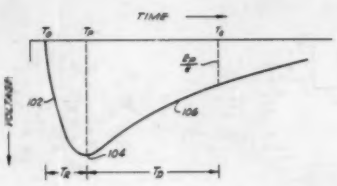
Filed Jan. 19, 1981, Ser. No. 226,361
Int. Cl.³ G01V 9/00
U.S. Cl. 250—253 **9 Claims**

1. Apparatus for detection and analysis of uranium minerals deposited in the earth surface, comprising:

an ultraviolet light source for irradiating the earth surface with ultraviolet light having a first selected wavelength;

means for detecting fluorescence at a second selected wavelength to provide an electrical output signal indicative thereof;

first means for analyzing said output signal to generate a voltage indicative of fluorescence peak response;



second means responsive to said output signal to generate a voltage pulse having a duration equal to fluorescence decay time; and

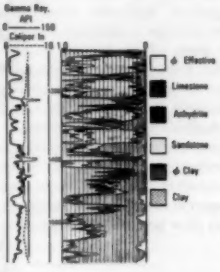
third means responsive to said output signal to generate a voltage pulse having a duration equal to fluorescence excitation time.

4,464,569

METHOD AND APPARATUS FOR SPECTROSCOPIC ANALYSIS OF A GEOLOGICAL FORMATION

Charles Flaum, Danbury, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jun. 19, 1981, Ser. No. 275,093
Int. Cl.³ G01V 5/10
U.S. Cl. 250—270 **18 Claims**



18. A system for the analysis of earth formations surrounding a well borehole comprising:

a. A neutron spectroscopy logging tool for obtaining a series of capture gamma ray representative of the interaction of thermal neutrons with various chemical elements in said formation upon passing through said borehole;

b. means responsive to said capture gamma ray spectra for determining relative spectral elemental yields of gamma rays indicative of the presence of said various chemical elements in said formation;

c. means for recording said spectral elemental yields as a function of depth in said borehole to produce a plurality of traces;

d. means for combining relative tool sensitivities to the presence of a plurality of formation basic components containing said elements with said spectral elemental yields to determine the volume fractions of a plurality of said formation basic components; and

e. means for recording said volume fractions as a function of depth to generate a tangible record.

4,464,570

METHOD FOR ION CYCLOTRON RESONANCE SPECTROSCOPY

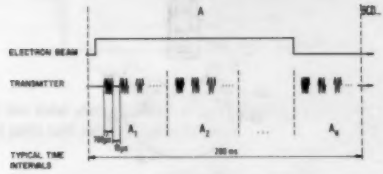
Martin Allemann, CH 8311 Ottikon, and Hanspeter Kellerhals, CH 8610 Uster, both of Switzerland

Filed Jun. 18, 1982, Ser. No. 390,050

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1981, 3124465

Int. Cl.³ B01D 59/44; H01J 49/00

U.S. Cl. 250—291 8 Claims



1. A method of ion cyclotron resonance respectroscopy, comprising the steps of providing a gaseous sample substance contained in a measuring cell;

exposing said substance to a constant magnetic field in a predetermined direction;

subjecting said sample substance to a plurality of successive selection cycles in which each cycle comprises ionizing said substance, subjecting said substance to an electrical radio frequency selection field oriented orthogonally to the direction of said magnetic field and having at least one frequency corresponding to the cyclotron resonance frequency of at least one undesired species of ions in said sample substance, said sample substance being exposed to said radio frequency selection field for a period of time until the orbital radii of the undesired ions have reached a magnitude at which said undesired ions collide with the walls of the measuring cell and are thereby eliminated;

said radio frequency selection field being limited to frequencies other than a cyclotron resonance frequency of a desirable species of ions in said sample substance;

and subsequently subjecting said sample substance to an electrical radio frequency measuring field oriented orthogonally to the direction of said magnetic field and having a frequency corresponding to the cyclotron resonance frequency of the desirable ions for measuring the desirable ions,

whereby the concentration of the desirable ions in the measuring cell is increased by the successive selection cycles.

4,464,571

OPPOSING FIELD SPECTROMETER FOR ELECTRON BEAM MENSURATION TECHNOLOGY

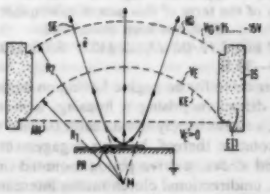
Erich Plies, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 19, 1982, Ser. No. 409,630

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138901

Int. Cl.³ H01J 49/44

U.S. Cl. 250—305 6 Claims



1. In an electrostatic opposing field spectrometer for undertaking measurements by means of an electron beam probe at various points on a test specimen and having an extraction electrode, the improvement comprising:

an opposing field electrode for generating a spherically symmetric opposing field including a lower spherically symmetric network disposed above said specimen and being at a first potential, and an upper spherically symmetrical network disposed above said test specimen at a second potential and;

said extraction electrode being disposed parallel to said test specimen.

4,464,572

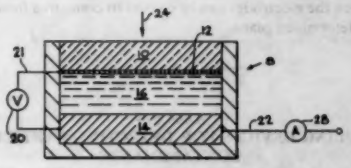
INFRARED PHOTOEMITTING DIODE HAVING REDUCED WORK FUNCTION

Tomas B. Hirschfeld, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 6, 1982, Ser. No. 375,518

Int. Cl.³ G01J 1/00

U.S. Cl. 250—338 14 Claims



1. A photoemitting diode for sensing infrared radiation, which comprises:

a photocathode defining a first surface aligned to receive infrared radiation, and a second surface containing electrons which are emitted in response to the received infrared radiation, said photocathode being constructed of at least one metal from Groups I, II, and III of the periodic table;

an anode positioned substantially parallel to and spaced apart from said photocathode;

a liquid medium disposed between and contacting said photocathode and anode, said medium having the formula NR_3 wherein R is independently selected from the group consisting of H and alkyl radicals of 1 to 3 carbon atoms and said medium having an affinity for the electrons in said photocathode, the magnitude of the affinity being less than the work function of said photocathode, and being capable of accepting and holding said emitted electrons as stable solvated species;

means for generating and applying a voltage potential difference between said photocathode and anode whereby emitted electrons flow as an electric current from said photocathode through said medium to said anode; and

means for detecting, measuring and analyzing said electric current to determine the quantity of said infrared radiation.

4,464,573

CHARGED PARTICLE BEAM FOCUSSING DEVICE

Robert L. Dalgish, Abbotsford, Australia, assignor to Unisearch Limited, Kensington, Australia

Filed Mar. 8, 1982, Ser. No. 355,696

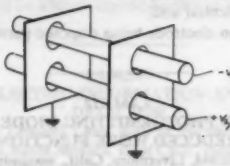
Claims priority, application Australia, Mar. 9, 1981, PE7909

Int. Cl.³ B23K 15/00; H01J 37/26; H05H 5/00

U.S. Cl. 250—396 R 3 Claims

1. A charged particle beam focussing device comprising a first pair of truncated linear electrodes to which potential differences are maintained with respect to a ground plane, the

electrodes being arranged on either side of a path of the beam to be focussed, the configuration of the electrodes being such that the significant electric field between them is confined to a short section of the path, and a second pair of truncated electrodes parallel to and in a plane substantially parallel to the plane of the first pair and displaced in a direction parallel to the



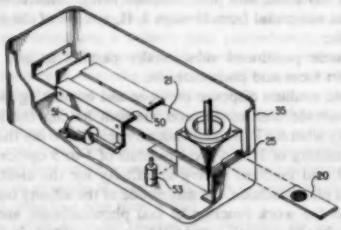
plane in which the first pair of electrodes lie, potential differences with respect to the ground plane being maintained on each of the second pair of electrodes, the arrangement being such that by variation of the potentials between the electrodes a beam of charged particles passing along the said beam path between the electrodes can be caused to come to a focal line in a predetermined plane.

4,464,574

SAMPLING DEVICES FOR DETECTING PARTICULATE CONTAMINANTS

George Vandrish, Vanier, Canada, assignor to Pylon Electronic Development Co., Ltd., Nepean, Canada

Filed Mar. 3, 1982, Ser. No. 354,215
Claims priority, application Canada, Mar. 19, 1981, 373367
Int. Cl.³ G01N *21/85*
U.S. Cl. 250—432 PD **6 Claims**



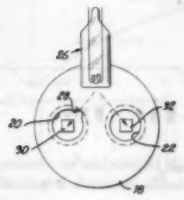
1. A sampling device for detecting particulate contaminants in a gaseous medium comprising means for holding at least one filter for movement between a sampling position at which the filter is exposed to the gaseous medium and a measurement position at which the amount of particulate material collected by the filter can be measured, said filter comprising a filter membrane sandwiched between two pieces of plastic material having holes exposing said filter membrane to said gaseous medium, wherein the filter holding means comprises a first plate having a recessed area at one end thereof into which may be inserted the filter, said recessed area having a hole therethrough communicating with said filter membrane, and a filter holder assembly secured to said one end of said first plate, said filter holder assembly having a hole in registration with the hole in the first plate, conduit means adapated to be received in the hole in the holder assembly, and means to sealingly connect said conduit means in communication with the filter, said first plate being movable whereby the filter is movable between the sampling position and the measurement position.

4,464,575

TEST DEVICE FOR AN OPTICAL INFRA RED DETECTOR

John M. Cholin, Oakland, N.J.; Jeffrey G. Cholin, Pound Ridge, N.Y., and Ray Voorhis, Midland Park, N.J., assignors to Firetek Corporation, Hawthorne, N.J.

Filed Sep. 6, 1983, Ser. No. 529,276
Int. Cl.³ G01V *5/00*
U.S. Cl. 250—554 **9 Claims**



1. A test system for checking the sensitivity of a multiple channel optical infra red fire detecting system, including at least two photocells, the detecting system responsive to the relative quantity of incident radiant energy at at least two different peak wavelengths, the detecting system producing a warning signal when the relative quantity of incident radiation of two wavelengths exceeds a predetermined threshhold, the photocells positioned in the detector housing member and oriented and aligned therein to detect the incident radiant energy, the test system comprising:

(a) an aperture plate positioned on the detector housing member, the aperture plate including respective openings aligned with each photocell, the openings having sufficient minimum area and depth to allow the quantity of broad band radiation emanating from a fire to be equally received by each photocell;

(b) means for emitting radiant energy at each of the peak wavelengths of the photocells in the detector positioned in close proximity to each respective opening in said aperture plate, whereby radiant energy from said emitter means impinges on all photocells; and

(c) electrical means for varying the power to the emitter means upon command,

at least one predetermined opening in said aperture plate differently configured so as to allow a greater quantity of radiation from said emitter means to impinge on its respective photocell as compared to the emitter means radiation received by the other cell(s) via their corresponding opening(s), whereby as the power to the emitter means is varied the predetermined threshold of the detecting system is reached and the alarm signal activated.

4,464,576

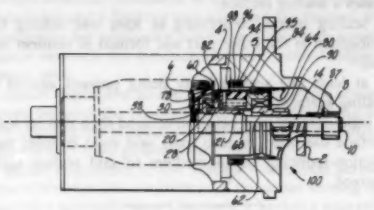
ENGINE STARTER DRIVE

James O. Williams, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Continuation of Ser. No. 199,410, Oct. 22, 1980, Pat. No. 4,366,385. This application Sep. 28, 1982, Ser. No. 425,587
The portion of the term of this patent subsequent to Dec. 28, 1999, has been disclaimed.
Int. Cl.³ F02N *11/02, 11/00*; H02P *9/00*; H02K *1/06*
U.S. Cl. 290—38 R **19 Claims**

1. A starter drive for an engine having an engine ring gear, said starter drive comprising a housing, a motor, a motor driven shaft, a sleeve axially advanceable on said motor driven shaft upon rotation thereof, housing engagement means connected to said sleeve, a drive pinion mounted on said motor driven shaft, unidirectional clutch means interconnecting said sleeve and said drive pinion, and means for engaging said housing engagement means to said housing as said drive pinion

is advanced axially along said motor driven shaft such that said drive pinion is held in mesh with said engine ring gear and such

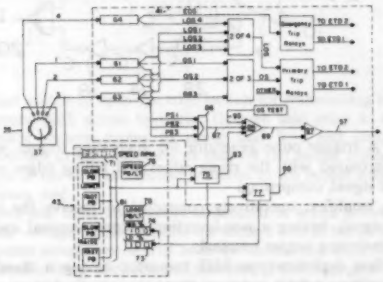


that the total motor torque is transmitted to said engine ring gear until said motor is deactivated.

4,464,577
TURBINE SPEED CONTROL

James B. Wagner, Peabody, and Harvey H. Chamberlain, Marblehead, both of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Jun. 18, 1982, Ser. No. 389,608
Int. Cl.³ H02P 9/04
U.S. Cl. 290—40 A **6 Claims**



1. A control system for a prime mover including channels for normal, overspeed and emergency overspeed speed control of the prime mover comprising:

a plurality of "n" identical speed pick-ups receiving signals in parallel from said prime mover;

a plurality of "n−1" speed translators each receiving a separate speed signal from a respective speed pick-up and each speed translator providing a proportional speed output, a primary overspeed output and a loss of signal output;

an additional speed translator receiving a separate speed signal from its respective speed pick-up and providing an emergency overspeed output and a loss of signal output;

a first logic circuit receiving all of said loss of signal outputs to provide a single loss of signal trip signal when said logic requirements are met;

a second logic circuit receiving all of said primary overspeed outputs to provide a single primary overspeed trip signal where said logic requirements are met;

a gating logic connected to said proportional speed outputs and providing a single proportional speed output and means converting said speed output into a valve position signal; and,

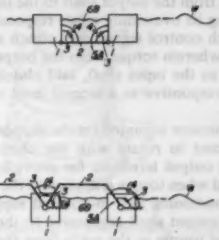
at least one primary trip relay connected to said first and second logic outputs; and,

at least one emergency trip relay connected to said emergency overspeed.

4,464,578
WAVE ENERGY CONVERTER

Masami Masubuchi, Ibaragi, Japan, assignor to Osaka University, Osaka, Japan

Filed Apr. 7, 1981, Ser. No. 251,738
Claims priority, application Japan, Apr. 14, 1980, 55-48906
Int. Cl.³ F03B 13/12
U.S. Cl. 290—42 **8 Claims**



1. A wave energy converter for extracting energy from a body of water subject to wave activity, comprising

at least two floats floating in said water, said floats being free of the coastal ground and sea bed and allowed to heave, surge and roll, said floats being disposed at a right angle to the direction of incidence of waves in said body of water;

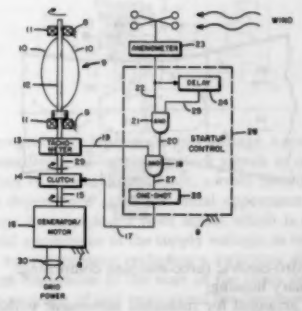
linkage means including a plurality of links, each of said links having one end pivotally coupled to one of said floats and the other end pivotally coupled to an adjacent float, a float and associated link comprising a float group; and

restoring and damping means coupled between each of said floats and said linkage means, said floats, linkage means, restoring means and damping means forming a dynamic system for the extraction of wave energy from the movements of said floats relative to said linkage means, said dynamic system having a natural frequency tuned approximately to the frequency of said incident waves, whereby reflected and transmitted waves caused by said floats are substantially suppressed because of the extraction of energy from said incident waves.

4,464,579
DERRIEUS WIND TURBINE ELECTRIC GENERATING SYSTEM

Edward L. Schwarz, Minneapolis, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Jun. 17, 1982, Ser. No. 389,524
Int. Cl.³ F03D 7/06; H02P 9/06
U.S. Cl. 290—44 **4 Claims**



1. In an electric generating system of the type to be connected to a power grid carrying current of preselected fre-

quency and phase, and to supply power to and receive power from the grid, and designed to operate with a wind turbine prime mover having negligible starting torque, the combination of

(a) a support on which the turbine can be mounted;

(b) a clutch having an input shaft for connection to the turbine shaft and an output shaft, and having an overriding mode permitting the transfer of torque from the input shaft to the output shaft and preventing the transfer of torque from the output shaft to the input shaft, said clutch entering its overriding mode responsive to a first level of a clutch control signal, said clutch also having a lockup mode wherein torque from the output shaft can be transferred to the input shaft, said clutch entering its lockup mode responsive to a second level of the clutch control signal;

(c) A generator mounted on the support and whose rotor is connected to rotate with the clutch output shaft, and having output terminals for providing electric power to the grid when torque is applied to the rotor, said generator also functioning as a motor and supplying torque to the clutch output shaft responsive to the combination of absence of torque to the rotor from the clutch output shaft and current input to the generator output terminals;

(d) an anemometer mounted adjacent the wind turbine support and producing a wind strength signal having a first level indicative of wind below a predetermined threshold speed, and a second level indicative of wind at or above the threshold speed;

(e) turbine operating condition indicating means sensing whether the turbine is rotating, for supplying a turbine speed signal having a first level responsive to the turbine having rotational speed above a predetermined level, and a second level otherwise; and

(f) start-up control means receiving the turbine speed signal and the wind strength signals, for supplying a clutch control signal having its second level for at least a predetermined interval responsive to the wind strength signal falling within its second level when the turbine speed signal is at its second level, and supplying a clutch control signal having its first level otherwise.

4,464,580

HYDRO-ELECTRIC TURBO-MACHINE

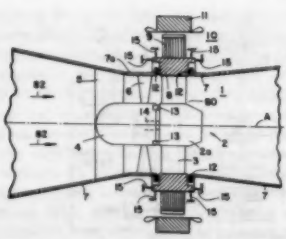
Helmut Miller, Bergdietikon, Switzerland; Kurt Baumann, Kressbronn; Franz Halder, Ravensburg, both of Fed. Rep. of Germany, and Noël Meystre, Meilen, Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland

Filed Mar. 17, 1982, Ser. No. 358,857

Claims priority, application Switzerland, Apr. 7, 1981, 2334/81

Int. Cl.³ F16J *15/00, 15/34*

U.S. Cl. 290—52 **23 Claims**



1. A hydro-electric turbo-machine comprising:

a stationary housing;

a rotor arranged for rotational movement within said stationary housing;

at least one substantially ring-shaped sealing means for sealing water flowing through the turbo-machine between predetermined parts of the rotor and the stationary housing;

one of said parts serving as a rigid counter part which possesses a sealing surface;

said sealing means comprising at least one sealing body embedded in the other part and formed of resilient material;

said at least one sealing body being pressed against said sealing surface; and

said rigid counter part being structured such that its sealing surface has infed thereto from said rigid counter part a friction-reducing liquid medium to said sealing surface thereof.

4,464,581

TRIGGER PULSE GENERATOR

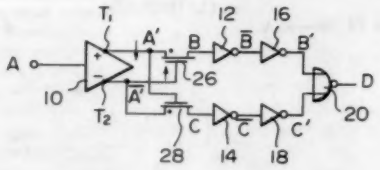
Atsushi Oritani, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 23, 1982, Ser. No. 371,503

Claims priority, application Japan, Apr. 28, 1981, 56-64442

Int. Cl.³ H03K *3/017, 5/04, 5/153*

U.S. Cl. 307—265 **8 Claims**



1. A trigger pulse generator for generating trigger pulses synchronized with the rising edges and falling edges of an input signal, comprising:

an amplifier, operatively connected to receive the input signal, having a non-inverting output terminal and an inverting output terminal;

a first depletion-type MIS transistor having a threshold voltage, a drain or source electrode operatively connected to said non-inverting output terminal of said amplifier for outputting a signal and a gate electrode operatively connected to said inverting output terminal of said amplifier;

a second depletion-type MIS transistor having a threshold voltage, a drain or source electrode operatively connected to said non-inverting output terminal of said amplifier for outputting a signal and a gate electrode operatively connected to said non-inverting output terminal of said amplifier; and

a gate circuit operatively connected to said first and second depletion-type MIS transistors, which generates the trigger pulses synchronized with the rising edges and the falling edges of the input signal upon receipt of said signals from said source or drain electrodes of said first depletion-type MIS transistor and said second depletion-type MIS transistor.

4,464,582

WATER-SAFE HAIR DRYER CIRCUIT

Tsunehide Aragaki, c/o 122 E. 42nd St., New York, N.Y. 10017, and Yukio Noguchi, 3F, 22-5, Ching-Chung St., Taichung, Taiwan

Filed Oct. 12, 1982, Ser. No. 433,652

Int. Cl.³ H02H *3/16*

U.S. Cl. 307—118 **3 Claims**

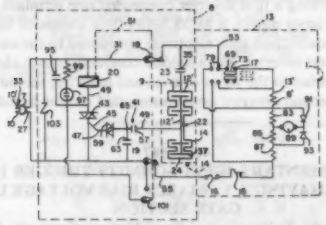
1. A power shut-off circuit for water sensing means having opposing, spaced-apart conductors adapted to produce a volt-

age when water bridges the space between the conductors comprising:

(a) a power shut-off means having first and second normally closed switches connected in a circuit to a power source means having a first leg and a second leg formed with a condensor for producing a voltage connection across the space between the conductors when water bridges said space; and

(b) means responsive to the voltage connection across the space between the conductors of the water sensing means for opening the normally closed switches for shutting off the circuit to the power source means,

the means responsive to the voltage connection across the space between the conductors of the water sensing means having a normally open triac switch having a gate responsive to said voltage connection and first and second leads including a relay connected respectively to opposite legs of the power source means, said gate being connected for transmitting the voltage connection in an initial path to the



triac switch to open the triac switch for transmitting in a second path across said triac through said relay to the power source means to cause said first and second switches to open, thereby to shut-off the circuit connection of the first and second switches to the power source means, and

second and third condensors connected in series between said voltage connection and the second lead of the power source means, one side of both the second and third condensors being connected to one side of the triac gate for responding to the voltage connection for transmitting a voltage to the normally-open triac switch that exceeds the breakover voltage thereof to close the triac switch in response to the bridging of the space between the opposing conductors of the water sensing means by water in accordance with the charging of the condensors from the power source means even when there is only a momentary voltage connection across the space between the conductors of the water sensing means.

4,464,583

APPARATUS FOR BONDING AND PROTECTING ELECTRICAL CABLE SHIELDS

Nils V. Holmgren, Greendale, Wis., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Mar. 4, 1983, Ser. No. 471,992

Int. Cl.³ H01R 7/12

U.S. Cl. 307—147 **16 Claims**

1. Apparatus for single-point bonding, multi-point or cross-bonding electrical power cables, comprising:

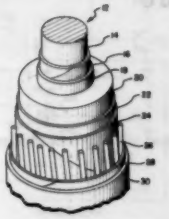
a. an insulated electrical housing having an interior connecting cavity open to the exterior of said housing;

b. insulated cover means, removably carried by said housing, for covering the opening to said connecting cavity;

c. a first electrical conductor, carried by said housing, having one end disposed to the exterior of said housing and an opposite end disposed within said connecting cavity;

d. a second electrical conductor, carried by said housing, having one end disposed to the exterior of said housing and an opposite end disposed within said connecting cavity;

e. linking means, carried by said cover means, for removably and electrically connecting together those ends of said first and second electrical conductors which are disposed within said connecting cavity; and



f. connecting means, carried by said housing, for electrically connecting said linking means to the exterior of said housing,

whereby said first and second electrical conductors are electrically connected together and to the exterior of said housing when said cover means is in place.

4,464,584

MICROPROCESSOR WITH RESETTING CIRCUIT ARRANGEMENT

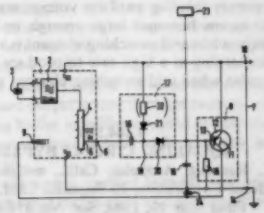
Hanspeter Hentzschel, Munich, and Achim Beek, Weissenfeld, both of Fed. Rep. of Germany, assignors to Eurosil GmbH, Erching, Fed. Rep. of Germany

Filed Oct. 20, 1981, Ser. No. 312,989

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1980, 3040326

Int. Cl.³ H03K 17/22, 17/28

U.S. Cl. 307—200 A **5 Claims**



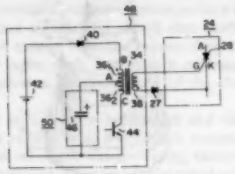
1. In a microprocessor having a supply voltage, a reset input and a clock oscillator for supplying clock signals to synchronize operations of the microprocessor, a reset circuit means operating in dependence upon the initial appearance of the supply voltage for applying a reset signal which is derived from the initial appearance of the supply voltage, to said reset input of the microprocessor, including a switching stage, including means responsive to the start of the clock oscillator begun at the presence of said reset signal for deactivating the reset circuit means to remove the reset signal from the reset input after a time period to thereby ensure a steady state clock and syndronous operating conditions for said microprocessor.

4,464,585

GATE CIRCUIT OF GATE TURN-OFF THYRISTOR

Nagataka Seki, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 242,158, Mar. 9, 1981, abandoned. This application Aug. 22, 1983, Ser. No. 525,262
Claims priority, application Japan, Mar. 27, 1980, 55-38186
Int. Cl.³ H03K *17/72*
U.S. Cl. 307—252 C **11 Claims**



1. A gate circuit of a gate turn-off thyristor comprising:

a first circuit means connected across the cathode and the gate of said gate turn-off thyristor for applying thereacross a pulse voltage with a high rate of increase and lower rate of decrease, said first circuit means including a DC power supply and a series circuit connected across said DC power supply, said series circuit being a substantially lossless series circuit, and including:

(a) a pulse transformer having first and second primary windings and a secondary winding, with said first primary winding be connected in series with, and magnetically closely coupled to, said second primary winding,

(b) a rectifier circuit element connected in series with said secondary winding across the cathode and the gate of said thyristor to apply said pulse voltage, said rectifier circuit element connected with a polarity to conduct current from the gate to the cathode of said thyristor,

(c) a diode connected in series with said primary windings of said transformer for preventing a reverse current from flowing into said DC power supply, and

(d) a switching element connected in series with said primary windings of said transformer for switching on said series circuit when said thyristor is on so that said thyristor turns off;

a second circuit means connected to a junction between said first and second primary windings and one side of said power supply for charging at a low rate a large part of the exciting energy stored in said transformer by way of said first primary winding until the voltage across said second circuit means becomes large enough to bias said diode reversely when said switching element is switched off and for discharging at a high rate to produce a steeply rising edge pulse when said switching element is switched on.

4,464,586

SQUARING CIRCUIT BYPASS

Jerrold V. Henning, Anaheim, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

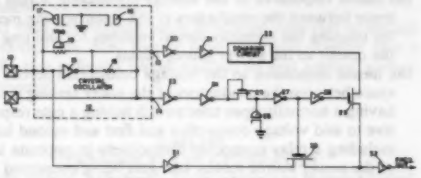
Filed May 10, 1982, Ser. No. 376,480
Int. Cl.³ H03K *19/094, 5/156, 3/017*
U.S. Cl. 307—271 **2 Claims**

1. A MOS integrated circuit comprising:

first and second terminals on said integrated circuit for connection to external clocking means for supplying a clock input signal to said integrated circuit having a predetermined first frequency but possibly possessing timing inaccuracies;

a divide-by-two squaring circuit on said integrated circuit connected to said first and second terminals for synchronously translating said clock input signal into an output signal for use internally in said integrated circuit, said output signal having a frequency one-half of said predetermined first frequency, the duration in which said output signal is at a high level being equal to the duration in which said output signal is at a low level; and

a bypass circuit on said integrated circuit connected to said first and second terminals and responsive to the clock input signal applied thereto, said bypass circuit being operative to selectively disable said divide-by-two squaring circuit so that said output signal has a frequency equal



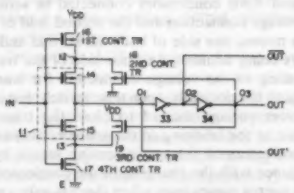
to said predetermined first frequency, said bypass circuit comprising a first inverter connected one terminal of said clock input means, a MOS field effect transistor having a first conduction path electrode connected to the output of said first inverter, and a second conduction path electrode connected to the input of a second inverter, the output of said second inverter constituting said output signal.

4,464,587

COMPLEMENTARY IGFET SCHMITT TRIGGER LOGIC CIRCUIT HAVING A VARIABLE BIAS VOLTAGE LOGIC GATE SECTION

Yasoji Suzuki, Yokosuka, and Kenji Matsuo, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 24, 1981, Ser. No. 295,825
Claims priority, application Japan, Oct. 14, 1980, 55-143320; Oct. 14, 1980, 55-143324
Int. Cl.³ H03K *3/037, 3/356, 19/094*
U.S. Cl. 307—279 **1 Claim**



1. A logic circuit with a variable bias voltage logic gate section, said logic circuit comprising:

an inverter which includes a first IGFET of a first conductivity type and a second IGFET of a second conductivity type each having a source, drain and gate, with said drains of said first and second IGFET's being coupled together to form an output terminal of said inverter and said gates of said first and second IGFET's being coupled together to form an input terminal of said inverter;

an output terminal for said logic circuit;

first and second load inverters connected in series between said output terminal of said inverter and said output terminal of said logic circuit;

first and second power terminals;

a first bias control IGFET of said first conductivity type which has a source-drain path connected between the source of said first IGFET and said first power terminal, and which has a gate connected to said input terminal of said inverter;

a second bias control IGFET of said first conductivity type which has a source-drain path connected between said

source of said first IGFET and said second power terminal, and which has a gate connected to the output of said second load inverter;

a third bias control IGFET of said second conductivity type which has a source-drain path connected between the source of said second IGFET and said first power terminal, and which has a gate connected to said output of said second load inverter; and

a fourth bias control IGFET of said second conductivity type which has a source-drain path connected between said source of said second IGFET and said second power terminal, and which has a gate connected to said input terminal of said inverter.

4,464,588

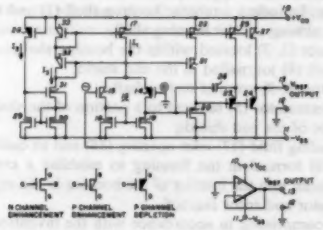
TEMPERATURE STABLE CMOS VOLTAGE REFERENCE

James B. Wieser, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 1, 1982, Ser. No. 364,548

Int. Cl.³ H03K *3/01;* **G05F** *5/08*

U.S. Cl. 307—297 **8 Claims**



1. A CMOS circuit for developing a reference potential having a value substantially independent of temperature, said circuit comprising:

a first transistor of depletion construction;

a second transistor of enhancement construction;

means for operating said first and second transistors as the differential input stage of an operational amplifier, said input stage being operated from a source of tail current;

means for biasing said first and second transistors from the output of said operational amplifier for equal conduction; and

means for sensing the offset in said input stage produced by said means for biasing whereby said offset provides said reference potential.

4,464,589

IL BUFFER HAVING HIGHER BREAKDOWN LEVELS

Toshinori Moriyasu, Chigasaki, and Masanori Nakai, Ebina, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 4, 1982, Ser. No. 405,272

Claims priority, application Japan, Aug. 17, 1981, 56-128449

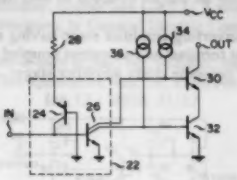
Int. Cl.³ H03K *19/091, 17/08, 17/10, 19/003*

U.S. Cl. 307—477 **5 Claims**

1. A buffer circuit comprising:

an IIL (integrated injection logic) gate having a plurality of output terminals;

a plurality of bipolar transistors the bases of which are connected to the output terminals of said IIL gate, respectively, the emitter-collector paths of said transistors being connected in series between a buffer output terminal and a reference voltage terminal; and



current source means connected to the bases of said transistors.

4,464,590

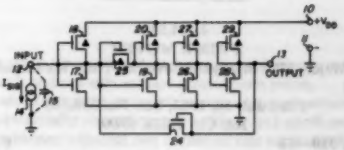
MEMORY SYSTEM CURRENT SENSE AMPLIFIER CIRCUIT

A. Karl Rapp, Los Gatos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 23, 1982, Ser. No. 391,254

Int. Cl.³ H03K *5/153, 5/08, 19/017;* **G11C** *7/06*

U.S. Cl. 307—530 **5 Claims**



1. In a current sensing amplifier having an input terminal coupled to a memory element which is to have its memory content sensed and an output terminal which produces a voltage state indicative of said memory content, said amplifier comprising:

a first inverter gate made up of an inverting transistor and a load transistor, having its output shorted to its input so that it operates at its trip point, and coupled to said input terminal to reduce the voltage swings thereof;

a second inverter gate, made up of an inverting transistor and a load transistor, and having an input node coupled to said input terminal and an output node coupled to said output terminal; and

first feedback means coupled between said second inverter gate input and output nodes; the improvement comprising;

a noninverting buffer amplifier coupled in cascade with said second inverter gate output node to drive said output terminal; and

second feedback means coupled between said output terminal and said input terminal of said sensing amplifier.

4,464,591

CURRENT DIFFERENCE SENSE AMPLIFIER

A. Karl Rapp, Los Gatos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 23, 1982, Ser. No. 391,255

Int. Cl.³ G01R *19/165;* **H03K** *5/24;* **G11C** *7/06*

U.S. Cl. 307—530 **10 Claims**

1. A differential current sensing amplifier circuit having a current sense input; a reference current input and and an output, said circuit comprising:

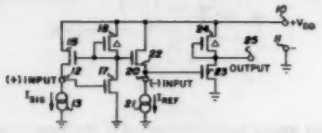
a first terminal comprising said current sense input;

a second terminal comprising said reference current input;

means for providing a reference current at said second terminal;

a first field effect transistor (FET) common drain amplifier stage having an output coupled to said first terminal and an input;

a first FET inverting amplifier stage having a input coupled to said first terminal and an output coupled to said input of said FET common drain amplifier stage;



a second FET common drain amplifier stage having an input coupled to said output of said first FET inverting amplifier stage and an output coupled to said second terminal; and

a second FET inverting amplifier stage having an input coupled to said second terminal and an output providing said sensing amplifier circuit output whereby said circuit output goes low when said current sense input exceeds said reference current and that goes high when said current sense input is lower than said reference current.

4,464,592

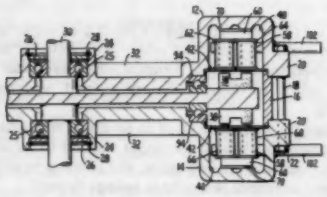
PRIME MOVER

Emery Major, 1210 Brickyard Cove Rd., Point Richmond, Calif. 94801

Filed Jul. 14, 1982, Ser. No. 398,087

Int. Cl.³ H02K 9/00

U.S. Cl. 310—54 **6 Claims**



1. Apparatus comprising, in combination:

a rotor including a circular flywheel of generally planar two-sided configuration rotatable about a central axis and a plurality of permanent magnets affixed to said flywheel, said magnets spaced from said axis and closely adjacent to the outer periphery of said flywheel and projecting from both planar sides of said flywheel substantially parallel to the direction of said axis, and

two stators coaxially positioned adjacent to said flywheel on opposite planar sides thereof and including a plurality of electromagnets positioned in selective registry with said rotor permanent magnets whereby periodic energization of said electromagnets will repel said permanent magnets and cause rotation of said rotor, each said stator additionally including a fluid-tight donut-shaped housing forming a channel accomodating said electromagnets and fluid coolant and a circular plate fixedly disposed over said channel in fluid-tight fashion to keep said fluid coolant away from said rotor; and

means for securing said stators in spaced relationship to said rotor, said securing means including a spacer ring positioned between the stators about the periphery of said rotor and means for attaching said stators to said spacing ring.

4,464,593

LIQUID COOLED COMMUTATION-TYPE DYNAMO ELECTRIC MACHINE

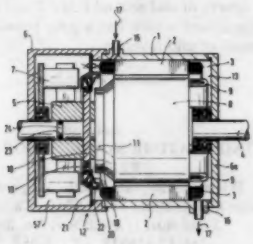
Wolfgang Kofink, Aichwald, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 10, 1982, Ser. No. 440,513

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1981, 3147829

Int. Cl.³ H02K 9/00

U.S. Cl. 310—58 **5 Claims**



1. Commutator-type dynamo electric machine having a housing, including a tubular housing shell (1) and end shields (6, 6a) closing off the housing shell;

a stator (2, 3) located within the housing shell;

a shaft (4) journalled in the end shield;

a rotor (8, 9) secured to the shaft;

a commutator (5) secured to a portion of the shaft adjacent one of the end shields;

a cooling fluid (17) inlet opening (15) and an outlet opening (16) formed in the housing to establish a cooling fluid circuit into the interior of the housing in the region of the stator and rotor thereof;

and comprising, in accordance with the invention

means (12) for separating cooling fluid within the housing from the space (57) therein in which the commutator (5) is located from the space (28) in which the stator (2) and the rotor (8) are located, including

a sealing disc (18) of insulating material mounted on the commutator and rotating therewith in a plane transverse to the axis of the shaft, and sealingly surrounding the commutator, and extending radially towards the housing,

a stationary sealing ring (20, 21) interengaging with the sealing disc, projecting radially inwardly from the housing and at least in part overlapping the sealing disc (18) to separate the space (57), within which the commutation is positioned from the remainder of the space (28) within the housing, the inlet and outlet openings (15, 16) being located in a region of said remainder of the space (28) and terminating therein, to establish fluid circuit throughout said remainder of the space of the housing only; and

a slinger disc (20) secured to the outer circumference of the insulating disc.

4,464,594

VEHICULAR GENERATOR WITH COOLING FAN MADE OF RUBBER COVERED SHAPE MEMORIZING ALLOY

Akio Matsumoto, Kanzaki; Mitsuharu Morishita, Himeji; Mitsuyoshi Yokota, Ibo, and Shinichi Kouge, Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1983, Ser. No. 487,702

Claims priority, application Japan, Apr. 28, 1982, 57-64564[U]

Int. Cl.³ H02K 9/00

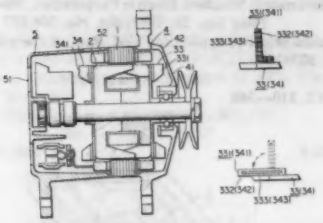
U.S. Cl. 310—63 **6 Claims**

1. A generator for a vehicle, comprising:

a rotor having a field winding;

at least one cooling fan having a plurality of blades fixed to said rotor;

a stator having an armature winding and front and rear brackets snugly fitted on said stator, and bearings in said brackets supporting said rotor for rotation within said armature winding;



at least a part of each blade of said plurality of blades of said cooling fan being made of a shape memorizing alloy covered with a soft, flexible, resilient material, said part of each blade, when the internal temperature of said generator has risen to a predetermined value, being at an angle to the plane of rotation of said rotor to cause a flow of air over said armature winding to perform a cooling action thereon.

4,464,595

FIELD SYSTEM OF MAGNET TYPE D.C. MOTOR HAVING MAGNETIC FLUX REDUCING POLE PIECES

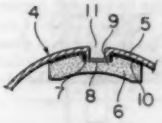
Isao Hamano, and Toshinori Tanaka, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Dec. 20, 1982, Ser. No. 451,344

Claims priority, application Japan, Dec. 22, 1981, 56-192293[U]

Int. Cl.³ F16L *55/07*; H02K *21/06*

U.S. Cl. 310—154 **4 Claims**



1. A field system of a magnet type D.C. motor comprising:

a cylindrical yoke,

a plurality of pole pieces each of which is made of a permanent magnet member bonded to an inner peripheral surface of said yoke, each pole piece having

a recess formed therein which extends along a central part thereof, and

a plurality of pairs of bent portions provided in said yoke each pair of bent portions in correspondence with each of said recess, and which are protruded inwards of said yoke and held in engagement with both side wall surfaces of said recess through an elastic member.

4,464,596

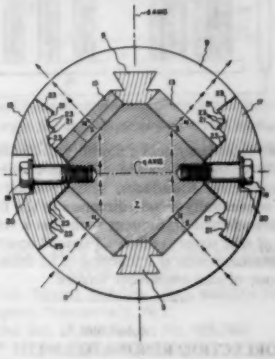
MULTI-SECTION PERMANENT MAGNET ROTOR

Timothy J. E. Miller, Schenectady; Donald W. Jones, Burnt Hills; Eike Richter, Scotia, and Gary L. Kalan, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 453,665, Sep. 27, 1982, abandoned. This application Sep. 28, 1983, Ser. No. 536,607

Int. Cl.³ H02K *21/12*

U.S. Cl. 310—156 **18 Claims**



1. A rotor for a permanent magnet machine comprising:

a north and a south arcuate shaped pole piece;

a shaft of magnetic material having a central portion with a substantially rhombic cross section, said north pole piece positioned adjacent one corner of said substantially rhombic central portion of said shaft and said south pole positioned adjacent a diagonally opposite corner of said shaft central portion, the major sides of said shaft central portion and the inner faces of said pole piece, defining the thickness in the radial direction of four apertures extending the axial length of the pole pieces;

four magnets, each magnet positioned in one of said apertures, respectively, two of said magnets each having its north seeking face adjacent the north pole piece and two of said magnets each having its south seeking face adjacent the south pole piece;

two arcuate shaped clamp pieces, each of said clamp pieces located between the north and south pole pieces and positioned to form a cylinder with said pole pieces; and

fastening means extending through said clamp pieces into holes formed in diagonally opposite corners of said central portion of the shaft, said clamp pieces having inclined surfaces engaging matching surfaces on said pole pieces to force said pole pieces toward said central portion of said shaft and thereby apply compressive force on said magnets when said fastening means are tightened.

4,464,597

SURFACE ACOUSTIC WAVE DEVICE COMPRISING AN INTERDIGITAL TRANSDUCER HAVING OMITTED FINGERS

Kentaro Setsune, Sakai, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 27, 1982, Ser. No. 343,175

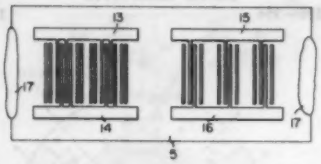
Claims priority, application Japan, Feb. 4, 1981, 56-16169; Jun. 16, 1981, 56-93598

Int. Cl.³ H01L *41/04*

U.S. Cl. 310—313 B **8 Claims**

1. A surface acoustic wave device comprising a piezoelectric transducer formed on one of the surfaces of a substrate of a piezoelectric material, said transducer comprising at least one pair of opposing interdigital transducer patterns provided on

said substrate, each including a plurality of commonly connected transducer fingers periodically spaced apart from each other by a distance of L in a surface acoustic wave propagating direction, where L is the wavelength of a surface acoustic wave at the frequency of maximum response of said piezoelectric transducer, some of said fingers in each of said patterns of said transducer being omitted to create a finger-free space



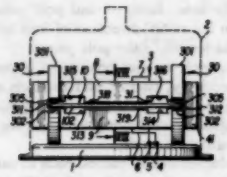
within said transducer, and a plurality of conductive strips not electrically connected to the common-connected fingers of said piezoelectric transducer, said conductive strips being disposed sequentially in said direction in the finger-free space of said piezoelectric transducer such that a width center of a first one of said strips is disposed spaced apart by a predetermined distance, which is a function of L, from a width center of a last one of said transducer fingers.

4,464,598

PIEZOELECTRIC RESONATOR WITH "DRAWER"

Raymond J. C. Besson, Bensancon, and Pierre C. Maitre, Pirey, both of France, assignors to L'Etat Francais, Paris, France

Continuation of Ser. No. 103,471, Dec. 14, 1979, abandoned. This application Nov. 19, 1981, Ser. No. 323,128
Claims priority, application France, Dec. 19, 1978, 78 35631
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—344 **21 Claims**



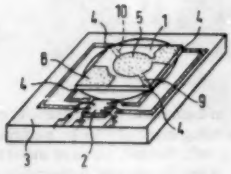
1. A piezoelectric resonator of the type comprising an airtight casing in which a vacuum has been created or an inert gas introduced, and inside this casing, at least one piezoelectric quartz crystal drawer provided with a peripheral part forming a ring connected to a central part by an intermediate zone which has a short length in the radial direction, electrodes placed respectively opposite each of the faces of the central part of the quartz crystal drawer, at a small distance from these, and means for maintaining the electrodes and quartz crystal drawer in predetermined relative positions inside the casing, whereby the means for maintaining the electrodes and quartz crystal drawer in position are provided comprising a single unit of rigid dielectric material forming a cabinet in which at least one drawer-like opening is made which has a section greater than the section of the quartz crystal drawer to permit the quartz crystal drawer to be inserted through said drawer-like opening and positioned within said cabinet, and the electrodes are deposited on the rigid dielectric cabinet in the central part respectively of the upper and lower faces of the drawer-like opening and the quartz crystal drawer is fixed in said drawer-like opening by its peripheral part in a manner such that the central part of the quartz crystal drawer remains located opposite the electrodes and spaced apart therefrom and the quartz crystal drawer is removable from said rigid dielectric cabinet without disassemblying said electrodes and said rigid dielectric cabinet.

4,464,599

PIEZOELECTRIC RESONATOR WITH INTEGRATED CAPACITANCES

Wolfgang Briese, Berlin, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,557
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1980, 3038260
Int. Cl.³ H01L *41/04*
U.S. Cl. 310—348 **11 Claims**



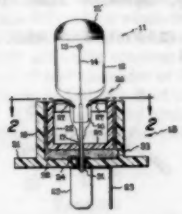
1. A piezoelectric resonator arrangement comprising:
a substrate having an opening;
a resonator crystal;
at least two electrode films positioned on said crystal;
means for holding said crystal on said substrate and over said opening at the vibration nodes of said crystal;
at least two capacitance films deposited on said crystal to provide circuit capacitance; and
conductive means for providing electrical connection to said capacitance films via said holding means.

4,464,600

LAMP UNIT HAVING ACCURATELY POSITIONED FILAMENT

Walter J. Kosmatka, South Euclid, and Frank E. Zalar, Euclid, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed May 21, 1982, Ser. No. 380,483
Int. Cl.³ H01J *5/48, 5/50*
U.S. Cl. 313—318 **7 Claims**



1. A lamp unit comprising a light bulb secured to a base, said light bulb containing a light source and having lead-in wires extending externally of the bulb, and said base comprising an inner member secured to said light bulb, lamp alignment and support means fitted within said inner base member to frictionally engage the light bulb in a fixed position aligned with respect to said inner base member, and an outer cup-shaped base member at least partly surrounding and spaced from said inner base member around the periphery and bottom thereof, the bottom of said cup-shaped outer base member being provided with openings into which said lead-in wires of the light

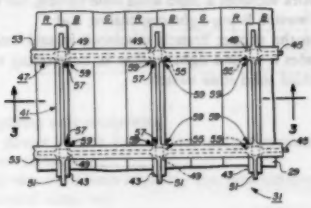
bulb extend, and means securing said inner base member to said outer cup-shaped base member, whereby prior to said securing of the base members said light bulb and inner base members are longitudinally, laterally, and rotationally movable with respect to said outer base member thereby permitting accurate alignment of said light source with respect to said outer base member.

4,464,601

CRT WITH QUADRUPOLAR-FOCUSING COLOR-SELECTION STRUCTURE

Stanley Bloom, Bridgewater, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 11, 1982, Ser. No. 407,276
Int. Cl.³ H01J *29/07*
U.S. Cl. 313—403 **8 Claims**



1. A cathode-ray tube including

(a) a target comprising an array of phosphor elements of different emission colors arranged in cyclic order in adjacent color groups, each group comprising an element of each of said different emission colors,

(b) means for producing a plurality of electron beams directed toward said target, and

(c) a color-selection structure positioned between said target and said beam-producing means, said color-selection structure producing a plurality of quadrupolar-focusing lenses, when operating voltages are applied to said structure, each lens defining a substantially rectangular window for transmitting portions of said beams to an associated color group of said target, said structure comprising (i) a first metal masking plate having therein a first array of substantially rectangular apertures and (ii) a second metal masking plate insulatingly spaced from said first masking plate with solid insulators, and having therein a second array of substantially rectangular apertures, the apertures of said first and second arrays being positioned relative to one another to produce said quadrupolar focusing lenses, and wherein each masking plate is a single metal layer consisting essentially of a first plurality of spaced parallel webs and a second plurality of spaced parallel webs orthogonal to said first plurality of webs, and one of the plurality of webs in at least one of said masking plates is electron-optically innocuous when operating voltages are applied to said color-selection structure.

4,464,602

THIN FILM ELECTROLUMINESCENT DEVICE

Joseph Murphy, Pittsburgh, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 28, 1982, Ser. No. 343,656
Int. Cl.³ H05B *33/12*
U.S. Cl. 313—509 **13 Claims**

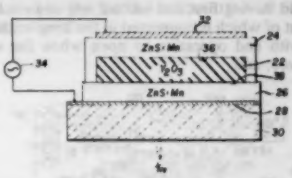
1. An electroluminescent device, comprising in combination:

at least one pair of identically composed active electroluminescent layers;

an insulating layer disposed between said pair of electroluminescent layers forming a composite structure thereby; and

a pair of electrodes on either side of said composite structure and contiguous to said pair of active electroluminescent layers, said electrodes being adapted for receiving an excitation voltage thereacross,

said pair of electroluminescent layers operating in conjunction with said insulating layer to provide not only emission of light energy, but also operating a current limiting means for any sustained discharge through said composite structure in the event of a voltage breakdown thereacross and preventing destruction of one or both of said electrodes.

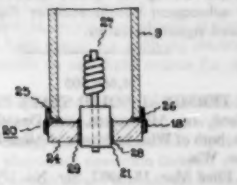


4,464,603

CERAMIC SEAL FOR HIGH PRESSURE SODIUM VAPOR LAMPS

Charles I. McVey, Shaker Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 26, 1982, Ser. No. 401,763
Int. Cl.³ H01J *61/36*
U.S. Cl. 313—624 **6 Claims**



1. An improved high pressure sodium vapor lamp having a tubular light-transmitting ceramic envelope with thermionic electrodes being sealed into its ends by ceramic closures, the improvement wherein said ceramic closures comprise and assembly of a ceramic disc having a larger diameter than the internal diameter of said tubular light-transmitting envelope and which is inserted into one end of a metal sleeve having a different diameter opening at its opposite end for circumferential engagement with said tubular light-transmitting envelope, and with the assembled members being hermetically sealed together by a ceramic sealing frit which directly bonds the ceramic disc to the metal sleeve.

4,464,604

TRACTOR WORK LIGHTING WITH AUTOMATIC DELUMINIZING CONTROL

Thomas P. Hillstrom, Clarendon Hills; Robert J. Wilson, Oswego, and John T. Corwith, Naperville, all of Ill., assignors to International Harvester Co., Chicago, Ill.

Filed Jul. 13, 1982, Ser. No. 397,706
Int. Cl.³ B60Q *1/26*
U.S. Cl. 315—79 **8 Claims**

1. Apparatus for controlling the energization, from a power supply, of flood lamps on a vehicle in dependence upon its speed comprising:

a selector switch connected to the power supply;

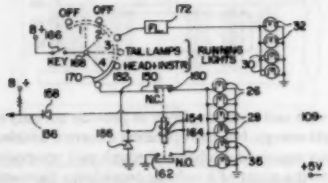
a set of flood lamps;

a lamp circuit connected in series with the switch and con-

necting the flood lamps between the switch and ground for lighting the lamps from the power supply;

a solenoid;

a shunt circuit connected to the switch so as to be shunt-connected thereby to the lamp circuit and connecting the solenoid in series between the switch and ground, said solenoid having first and second sets of switch contacts, the first of which is connected in the lamp circuit in series therewith and operative to open when the solenoid is energized; and



means responsive to high vehicle speed to generate and apply a high speed signal to energize the solenoid and operate its switch contacts, thereby open circuiting the lamp circuit and extinguishing the set of flood lamps;

the second set of solenoid switch contacts operative to close when the solenoid energizes and comprising holding circuit contacts connected in the shunt circuit in series therewith so as to afford to the solenoid upon energization the characteristic of a latching relay to hold itself in said shunt circuit, and to keep the vehicle flood lamps extinguished despite subsequent continuance or discontinuance of a high speed signal thereafter.

4,464,605

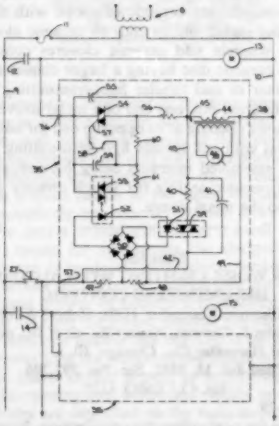
THREE TERMINAL SOLID STATE PILOT LIGHT

David E. Ford, Jr., Milwaukee, and Daniel G. Kannenberg, Waukesha, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Mar. 18, 1982, Ser. No. 359,268

Int. Cl.³ H01J *1/60*

U.S. Cl. 315—134 **1 Claim**



1. In a pilot light the combination comprising:

a pilot light lamp;

a transformer with a secondary winding connected across the lamp and with a primary winding;

a signal network having a supply branch subcircuit including a first bidirectional solid state switch operatively connected to the primary winding for supplying alternating current that causes illumination of said lamp, and a trigger branch subcircuit in controlling relation to said first bidirectional solid state switch; and

a test network having a supply branch subcircuit including a second bidirectional solid state switch operatively connected to the primary winding for supplying alternating current that causes illumination of said lamp, and a trigger branch subcircuit in controlling relation to said second bidirectional solid state switch;

wherein said bidirectional solid state switch in the supply branch subcircuit of said test network is light responsive and wherein the trigger branch subcircuit of said test network in controlling relation to said light responsive solid state switch includes a light emitter;

wherein the trigger branch subcircuit in said signal circuit network includes a third solid state switch, the third solid state switch being light responsive; and

wherein the trigger branch subcircuit in said test network includes a second light emitter in controlling relation to the third solid state switch.

4,464,606

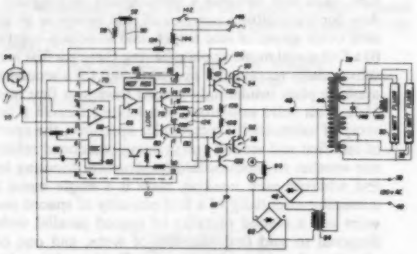
PULSE WIDTH MODULATED DIMMING ARRANGEMENT FOR FLUORESCENT LAMPS

John F. Kane, Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Continuation-in-part of Ser. No. 247,314, Mar. 25, 1981, abandoned. This application Oct. 7, 1982, Ser. No. 433,310

Int. Cl.³ H05B *41/29, 41/392*

U.S. Cl. 315—158 **5 Claims**



1. A relatively high efficiency, adjustable pulse width modulator energizing circuit for a fluorescent lamp for illuminating a surface which is also illuminated by ambient light, comprising:

a transformer having a primary winding, and a secondary winding for connection to said fluorescent lamp;

transistorized push-pull inverter means connected to said primary winding of said transformer for providing pulses of alternating polarity thereto when driven,

pulse width modulator drive means for driving said inverter means with drive pulses at a relatively high frequency;

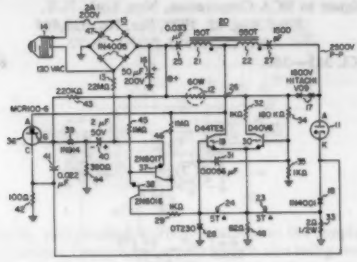
means for adjusting the width of said drive pulses to control the power which is applied to said fluorescent lamp;

said means for adjusting the width of said drive pulses including photo-responsive control means directed at said surface for sensing ambient light and florescent lamp light reflected from said surface.

4,464,607
LIGHTING UNIT

William Pell, North Syracuse; Thomas A. Brown, Fulton, and James E. Harris, Liverpool, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 25, 1981, Ser. No. 305,653
Int. Cl.³ H05B 37/02, 39/04, 41/36
U.S. Cl. 315—209 R 19 Claims



1. A lighting unit comprising:

A. a dc power source having two output terminals, one a reference terminal,

B. a metal vapor arc lamp requiring energization dependent on its electrical state, and

C. an operating network comprising:

(1) an incandescible resistive filament exhibiting a substantial resistance increase with applied voltage to provide standby light for said lamp,

(2) alternating electrical energy transforming means for coupling a stepped-up output voltage to said lamp,

(3) first switching means,

(4) second switching means having a stable nonconducting first condition and an astable conducting-nonconducting, second condition,

(5) interconnecting means for coupling current from said dc source,

(a) in a dc form to said filament and said first switching means in series for producing useful light, alternately with current in a periodic form to the input of said transforming means for starting said lamp,

(b) in a sustained periodic form to said filament for producing useful light and in a sustained periodic form to the input of said transforming means for transitioning said lamp, and

(c) in a dc form to said filament and said lamp in series for energizing and ballasting said lamp, the dissipation in said filament being too low to produce useful light during normal running operation of said lamp,

(6) control means comprising:

(a) means for repetitively turning said first switching means on for a relatively long period and off for a relatively short period during starting or restarting of said lighting unit, the ON condition of said first switching means precluding and the OFF condition permitting said astable condition of said second switching means, and

(b) means responsive to the electrical condition of said lamp, for maintaining

(i) said first switching means OFF after said arc lamp becomes conductive, and

(ii) said second switching means

in an astable condition during said OFF condition of said first switching means when said lamp is nonconductive;

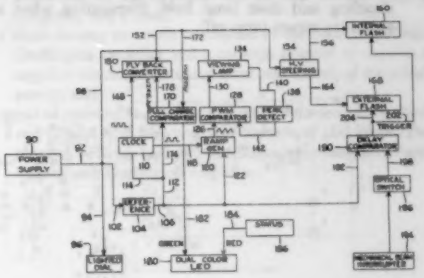
in a sustained astable condition after lamp conduction until warm-up; and

in said stable condition during warm-up and normal running operation of said lamp.

4,464,608
CIRCUIT FOR CONTROLLING OPTICAL APPARATUS SUCH AS AN OPHTHALMOSCOPE

H. Robert Pilley, Deering, N.H., assignor to Warner Lambert Technologies, Inc., Southbridge, Mass.

Filed Sep. 13, 1982, Ser. No. 417,757
Int. Cl.³ H05B 41/32; A61B 3/14
U.S. Cl. 315—241 P 27 Claims



1. In optical apparatus for viewing an object and making a photographic record thereof and having a photoflash light source;

(a) an electrically operated illuminating light source for illuminating the object during viewing prior to operation of said photoflash light source, said illuminating light source having an intensity proportional to the width of electrical pulses applied thereto;

(b) pulse generating means operatively connected to said illuminating light source for applying electrical pulses of controlled width to said light source for operating the same;

(c) energy storing and releasing means connected to said photoflash light source for storing energy and releasing said stored energy to said photoflash light source upon demand for photoflash operation thereof;

(d) conversion circuit means operatively connected to said energy storing and releasing means for converting electrical pulses applied thereto into energy to be stored for use in operating said photoflash light source; and

(e) a source of clock pulses operatively connected to said pulse generating means for operating the same and operatively connected to said conversion circuit means for supplying the pulses to be converted thereby.

4,464,609
FLASH LIGHTING UNIT FOR A CAMERA

Zenzo Nakamura, Saitama; Takashi Uchiyama, Yokohama; Shohei Ohtaki, Yokohama; Tokuichi Tsunekawa, Yokohama; Masanori Uchidoi, Yokohama, and Yukio Mashimo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 199,476, Oct. 22, 1980, abandoned, which is a continuation of Ser. No. 920,646, Jun. 30, 1978, abandoned, which is a continuation of Ser. No. 728,163, Sep. 30, 1976, abandoned. This application Nov. 14, 1983, Ser. No. 551,491
Claims priority, application Japan, Oct. 2, 1975, 50-119389
Int. Cl.³ H05B 41/14; G03B 15/05
U.S. Cl. 315—241 P 3 Claims

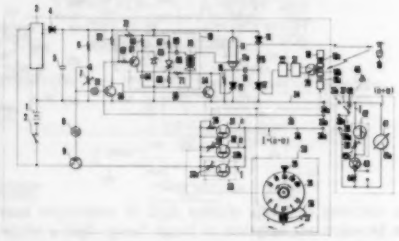
1. A flash unit for a photographic camera comprising:

(a) flash lamp means;

(b) means for connection to a source of electrical power;

(c) a storage capacitor connected to said means for connection to a source of electrical power to store a voltage capable of reaching a satisfactory firing level for said flash lamp means; '(d) striking means connected to said flash

lamp means and actuated by a synchronizing signal from said camera for initiating firing of said flash lamp means;
(e) voltage detecting means connected to said storage capacitor for detecting the voltage across said storage capacitor, said voltage detecting means having an output forming a charge completion signal;
(f) switching means connected between said flash lamp means said storage capacitor for enabling said flash lamp to illuminate when said switching mens turns on and disabling said flash lamp from illuminating when said switching means turns off;



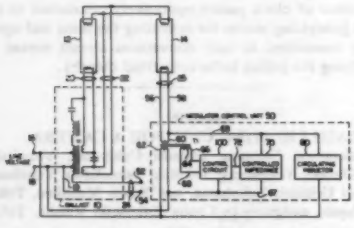
(g) inhibiting means responsive to a charge completion signal from said voltage detecting means for making said switching means turns off when said voltage detecting means detects that the voltage of the storage capacitor is not enough to illuminate said flash lamp means;
(h) means for transmitting an output signal from the voltage detecting means to the inhibiting means; and
(i) said striking means being arranged to be operative irrespective of the charge completion signal.

4,464,610

MODULAR LIGHTING CONTROL WITH CIRCULATING INDUCTOR

Ira J. Pitel, Morristown, N.J., assignor to Cornell-Dubilier Corp., Wayne, N.J.

Filed Jul. 27, 1981, Ser. No. 286,770
Int. Cl.³ H05B *41/392*
U.S. Cl. 315—291 **6 Claims**



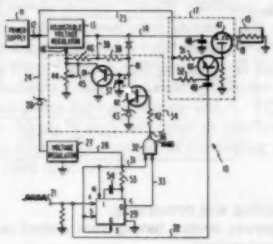
1. An apparatus for controlling output illumination level of a gas discharge lamp comprising:
a source of AC voltage;
ballast means coupled in series relationship with at least one said gas discharge lamp;
a controlled impedance coupled between the ballast output and at least one lamp;
means for controlling a period of conduction of the controlled impedance;
an isolation transformer, having its primary winding coupled between a neutral and a power supplying terminal of the ballast and further having a voltage tap on the primary winding, and having a secondary winding coupled to a cathode of the lamp(s);
an inductor coupled in parallel relationship with said controlled impedance providing a current path between said voltage tap and said discharge lamps at least when said impedance is non-conducting.

4,464,611

LINE CATHODE HEATING AND PROTECTION CIRCUIT

Jacob P. Hasili, Hamilton Township, Mercer County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 22, 1983, Ser. No. 525,494
Int. Cl.³ H01J *29/70, 29/72*
U.S. Cl. 315—366 **6 Claims**



1. A protection and pulse heating circuit for a line cathode in a flat panel display device, comprising:
an adjustable voltage regulator for providing a regulated output voltage having a selected level, said adjustable voltage regulator having a control input lead whereby said output voltage is regulated by the voltage on said control input lead;
control circuit means for controlling said voltage on said control input lead, said control circuit means including voltage responsive avalanche discharge means and charge storage means, said charge storage means being charged by said output voltage for controlling the voltage on said control input lead;
logic means for actuating said control circuit means in response to the horizontal synchronization pulses of said display device whereby said charge storage means is discharged by said avalanche discharge means in response to said logic means; and
pulse generator means responsive to said output voltage whereby said pulse generator means pulse heats said cathode in accordance with said horizontal synchronization pulses.

4,464,612

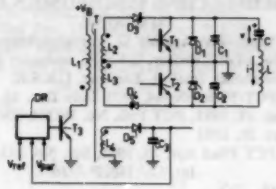
CIRCUIT ARRANGEMENT FOR A PICTURE DISPLAY DEVICE FOR GENERATING A SAWTOOTH-SHAPED LINE DEFLECTION CURRENT

Dirk J. A. Teuling, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 8, 1982, Ser. No. 337,918
Claims priority, application Netherlands, Jan. 13, 1981, 8100118
Int. Cl.³ H01J *29/70, 29/76*
U.S. Cl. 315—408 **15 Claims**

1. In a circuit arrangement for a picture display device for applying a sawtooth-shaped deflection current having a trace and a retrace to a line deflection coil, said coil being connected during the trace period to a trace capacitor by means of at least two series-arranged controllable deflection switches switched at the line frequency, said switches being non-conducting substantially simultaneously during the retrace period, and further circuit components, the deflection coil, the trace capacitor and further circuit components being interconnected to form a retrace capacitance that is part of a resonant network in said retrace period, the elements of said network determining

the duration of the retrace period, the circuit arrangement also comprising a supply winding coupled to a supply voltage source for supplying supply energy to the resonant network during the retrace period, the improvement wherein the supply winding is divided into at least two winding portions, one end of each winding portion being connected by means of a separate supply diode to the resonant network, the other end of each winding portion being connected to an associated deflection switch, said winding portions coupled to the supply voltage source via a controllable supply switch also being switched at the line frequency, said supply switch being conducting during at least a portion of the trace period for storing supply energy in the supply winding when the supply diodes are non-conducting and non-conducting during the remaining portion of the line period when the supply diodes are conducting, whereby current flowing through the supply diodes during the retrace period replenishes losses.

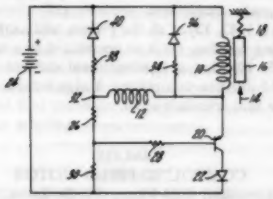


4,464,613

BLOCKING OSCILLATOR FOR A RECIPROCATING ELECTROMAGNETIC ACTUATOR

Ralph V. Brown, Cayuta, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Feb. 17, 1983, Ser. No. 467,522
Int. Cl.³ H02K 33/00, 33/02
U.S. Cl. 318—119 **16 Claims**



1. A blocking oscillator for reciprocating a biased armature comprising:
- a solenoid coil for generating a magnetic field operative to move said biased armature in response to a current flow therethrough, said solenoid coil having an input end and an output end;
- detection coil means magnetically coupled to said solenoid coil for producing a control signal in response to a change in said magnetic field generated by said solenoid coil, said detection coil means having one end connected to said output end of said solenoid coil and an opposite end;
- transistor means having an emitter connected to said output end of said solenoid coil, a collector and a base;
- diode means having an anode connected to said collector of said transistor means and a cathode;
- a pair of resistances, forming a voltage divider, connected between said opposite end of said detection coil means and said cathode of said diode means; and
- a resistance interconnecting said base of said transistor means with the junction between said pair of resistances.

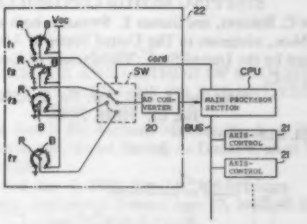
12. A blocking oscillator comprising:
- a spool having an inner diameter;
- a first predetermined number of turns of a first wire wound around said inner diameter, said first wire having a first end and a second end;
- a second predetermined number of turns of a second wire wound over said first predetermined number of turns, one end of said second wire adapted to receive a positive electrical potential from an external source and an opposite end connected to said first end of said first wire;
- a high gain silicon Darlington amplifier having an emitter connected to the opposite end of said second wire, a collector, and a base;
- a diode having an anode connected to the collector of said Darlington amplifier and a cathode adapted to receive a negative electrical potential from said source of electrical power; and
- a pair of resistances serially connected between said second end of said first wire and said cathode of said diode, the junction between said pair of resistances connected to said base of said Darlington amplifier.

4,464,614

NUMERICAL CONTROL UNIT

Mitsuo Kurakake, Hino, Japan, assignor to Fanuc Ltd., Tokyo, Japan

PCT No. PCT/JP81/00165, 371 Date Mar. 15, 1982, 102(e) Date Mar. 15, 1982, PCT Pub. No. WO82/00371, PCT Pub. Date Feb. 4, 1982
PCT Filed Jul. 16, 1981, Ser. No. 361,921
Claims priority, application Japan, Jul. 17, 1980, 55-97774
Int. Cl.³ G05B 19/24
U.S. Cl. 318—571 **4 Claims**

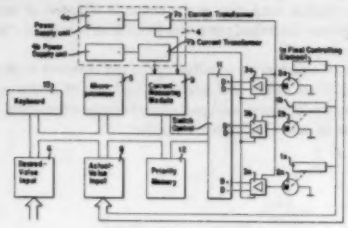


1. A numerical control unit for driving a motor at a feed speed designated by a feed speed dial on a control panel having a plurality of feed speed dials, each having a manually operable knob, the numerical control unit having a main processor section which performs data processing for numerical control and which emits a selection signal to select which of the feed speed dials will designate the motor's feed speed, comprising:
- potentiometer means corresponding to each knob for producing a DC voltage proportional to the amount that the corresponding knob is turned;
- analog/digital converter means for receiving an analog input signal and supplying a digital output signal to said main processor section; and
- switch means connected between said potentiometer means and said analog/digital converter means for selecting a DC voltage to apply to said analog/digital converter means as said input signal in response to said selection signal.

4,464,615
DEVICE FOR CONTROLLING A PLURALITY OF SERVOMOTORS ON PRINTING MACHINES

Anton Rodi, Leimen, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Dec. 9, 1982, Ser. No. 448,225
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1981, 3148947
Int. Cl.³ G05B *11/32*
U.S. Cl. 318—625 **6 Claims**

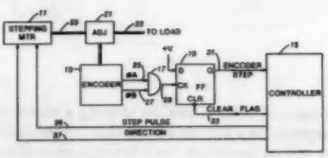


1. Device for controlling a plurality of servomotors on a printing machine having a plurality of printing units with the servomotors respectively assigned to individual zones of the printing units, a control unit connected to the servomotors for switching the servomotors on and off, and a power supply for supplying operating current to the servomotors, comprising a current-measuring module located in a connection between the power supply and the control unit for measuring a control current corresponding to the operating current supplied to the servomotors, said current-measuring module being controllable by a microprocessor for limiting the number of operating servomotors.

4,464,616
STEPPING MOTOR CONTROLLER

Steven C. Bourret, and James E. Swansen, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 2, 1982, Ser. No. 394,558
Int. Cl.³ H02K *29/04*
U.S. Cl. 318—696 **16 Claims**



1. A stepping motor system comprising:

a stepping motor rotatively responsive to a stepping pulse, said stepping motor having a rotatable output shaft with a plurality of rest positions;

a shaft encoder adjustably secured to said rotatable output shaft of said stepping motor, said shaft encoder generating for each rest position thereof first and second overlapping output pulses, said shaft encoder having a first and second output line for outputting respectively thereupon said first and second overlapping pulses;

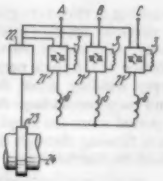
pulse means combining said first and second overlapping output pulses for generating a single encoder pulse therefrom, said pulse means having a two-input logic AND gate having one input connected to said first and the other input thereof connected to said second output line of said shaft encoder; and

processing means connected to said pulse means and receiving said single encoder pulse generated thereby for adding a delay thereto and thereafter for generating a stepping pulse for said stepping motor.

4,464,617
SUPERCONDUCTING SYNCHRONOUS ELECTRIC MACHINE

Leonid I. Yantovsky; Anatoly G. Miroshnichenko, and Evgeny K. Berzin, all of Kharkov, U.S.S.R., assignors to Kharkovsky Politekhnichesky Institut, Kharkov, U.S.S.R.

PCT No. PCT/SU80/00064, 371 Date Dec. 18, 1981, 102(e) Date Dec. 18, 1981, PCT Pub. No. WO81/03091, PCT Pub. Date Oct. 29, 1981
PCT Filed Apr. 25, 1980, Ser. No. 333,867
Int. Cl.³ H02P *7/36*
U.S. Cl. 318—717 **6 Claims**

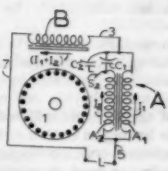


1. A superconducting synchronous electric machine, comprising a multiphase armature winding supported on an armature which, in turn, is supported on an armature shaft, a superconducting field winding, and a compensating winding constructed in the form of sections, the compensating winding being connected in series to the armature winding through a sliding contact, characterized in that the compensating winding (3) is made multiphase, sections (10) thereof comprise conductors (11, 12, 13) of all the phases, and each phase of the compensating winding (3) is so connected to a separate rectifier (14, 15, 16) that a unidirectional current flows therethrough and further comprising a sign-sensitive transducer mounted on said armature shaft.

4,464,618
COMPOUND FIELD MOTOR

James F. Shoemaker, 6264 Kinsey Pl., St. Louis, Mo. 63109

Filed Sep. 15, 1982, Ser. No. 418,246
Int. Cl.³ H02P *1/44*
U.S. Cl. 318—794 **7 Claims**



1. A single phase induction motor having a two phase stator winding comprising a main winding and an auxiliary cross field winding in series with each other throughout both the starting and running modes, said auxiliary winding having two branches wound in opposite directions, each of which has substantially the same number of turns as the main winding, one branch of said auxiliary winding being connected in series with a running capacitor, said one branch and said capacitor

being connected in parallel with the other branch of said auxiliary winding.

4,464,619

CIRCUIT ARRANGEMENT FOR THE CONTROLLED SUPPLY TO A LOAD

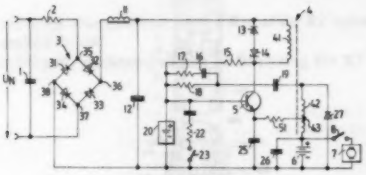
Gerhard E. Schwarz, Altena, and Günther Bergk, Raunheim, both of Fed. Rep. of Germany, assignors to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Jan. 11, 1982, Ser. No. 338,297

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1981, 3103863; Mar. 24, 1981, 3111432; Nov. 9, 1981, 3144486

Int. Cl.³ H02J *7/04*

U.S. Cl. 320—40 **11 Claims**



1. A circuit for supplying an electrical load with a substantially constant current from an input voltage source of variable voltage, comprising:

a blocking oscillator including a transformer having a primary winding and a secondary winding and a first transistor having first and second load terminals and a control terminal, said primary winding and said load terminals of said first transistor being connected in series across said voltage source;

a resistor-capacitor circuit connected between said secondary winding and said control terminal of said first transistor;

a reference voltage source connected to the control terminal of said first transistor;

a first diode connected between said secondary winding and a first terminal of said electrical load; and

voltage feedback means for applying to said first load terminal of said first transistor a portion of the voltage in said secondary winding.

4,464,620

CIRCUIT FOR GENERATING A SINUSOIDAL SYNCHRONIZATION VOLTAGE FOR FIRING THYRISTORS

Anton Schwager, Effretikon, and Hans-Jörg Suter, Winkel, both of Switzerland, assignors to Contraves AG, Zurich, Switzerland

Filed Apr. 5, 1982, Ser. No. 365,649

Claims priority, application Switzerland, Apr. 22, 1981, 2623/81

Int. Cl.³ G05F *5/00*

U.S. Cl. 323—300 **1 Claim**

1. A circuit for generating a sinusoidal synchronisation voltage for the firing of thyristors in a current regulation circuit of a drive for an electric motor powered by a power supply network, comprising, in combination:

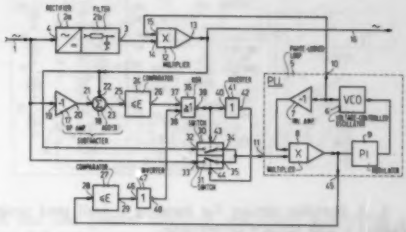
a phase-locked loop delivering an output voltage;

means for forming the synchronisation voltage as the product of the output voltage of the phase-locked loop and the mean value of the magnitude of the network voltage of the power supply network such that the output voltage of the phase-locked loop essentially equals the synchronisation voltage when the network voltage is sinusoidal and its peak value possesses a predetermined reference value;

means for comparing the synchronisation voltage with the network voltage and generating a first control signal when the network voltage essentially is equal to the synchronisation voltage;

said phase-locked loop having a reference frequency-input;

reversing switch means for conducting, during a first switching state thereof, the network voltage to the reference frequency-input of the phase-locked loop and, during a second switching state thereof, the synchronisation voltage to the reference frequency-input of the phase-locked loop;



means for comparing the phase of the voltage applied to the reference frequency-input of the phase-locked loop with the phase of the output voltage of the phase-locked loop and for generating a second control signal when the corresponding phase difference essentially equals null; and

said reversing switch means being controlled by both control signals such that said reversing switch means, upon absence of the first control signal and simultaneous presence of the second control signal, assumes its second switching state, otherwise assumes its first switching state.

4,464,621

TEST DEVICE FOR AND METHOD OF LOCATING FAULTS IN A TWO-WIRE LINE OR FOR SWITCHING TWO-WIRE LINES

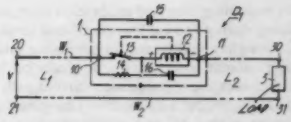
Hubert Prigent, Bat. N 401 Kerhuel; Maurice Roudeau, Rés. de la Commanderie, and Michel Daniel, Ar Leslac'h, all of Lannion, France (22300)

Filed Apr. 6, 1982, Ser. No. 365,962

Claims priority, application France, Apr. 17, 1981, 81 07783

Int. Cl.³ G01R *31/02*

U.S. Cl. 324—52 **24 Claims**

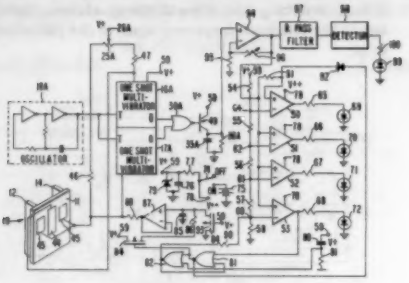


1. A test device for locating faults in a two-wire line comprising a first dipole connected in series on one of the line wires, the first dipole including: means for inserting a constant ohmic value in series with said one line wire when the current flowing from the one line wire through the dipole is less than a predetermined value, and means for increasing the ohmic value inserted in series with said one line wire sharply to a higher value in a high-current range when the current flowing from the one line wire through the dipole is greater than said predetermined current value.

4,464,622
ELECTRONIC WALL STUD SENSOR

Robert C. Franklin, 914 Bicknell Rd., Los Gatos, Calif. 95030

Filed Mar. 11, 1982, Ser. No. 357,019
Int. Cl.³ G01R *19/00*
U.S. Cl. 324—67 5 Claims

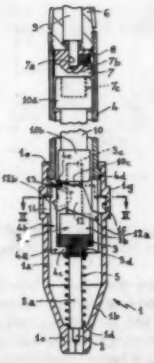


1. A portable device for locating a wall stud positioned behind a wall surface comprising:
- a first capacitor plate;
- a pair of second capacitor plates located one on each side of said first capacitor plate and in substantially the same plane as said first capacitor plate;
- means for conducting a charge to said first capacitor plate;
- means for conducting a charge to said pair of second capacitor plates;
- means for producing an intermediate output signal representative of the change in the relative capacitance between said first capacitor plate and said pair of second capacitor plates in response to said first capacitor plate and said pair of second capacitor plates being moved along said wall surface;
- means, responsive to said intermediate output signal, for adjusting the amplitude of said intermediate signal to compensate for variations in the characteristics of said means for producing;
- means, responsive to said intermediate output signal, for displaying any change in relative capacitance between said first capacitor plate and said pair of second capacitor plates;
- means for automatically calibrating said device including:
  - means for supplying a calibration charging current to said pair of second capacitor plates;
  - means for detecting when said intermediate output signal caused by said calibration charging current exceeds a selected threshold value;
  - means for holding said calibration charging current constant when said intermediate output signal reaches said threshold value;
- means for indicating that said calibration charging current is increasing during the calibration of said device;
- means for resetting said means for supplying said calibration charging current comprising a normally on MOS device which provides a low impedance current path to reset said means for supplying a calibration charging current when said device is shut off and which provides a high impedance path to prevent the resetting of said means for supplying when said device is turned on;
- means, responsive to said intermediate output signal, for detecting the presence of a line carrying alternating current behind the surface of said wall comprising:
  - bandpass filter means for rejecting those components of said intermediate output signal not in the range of frequency of said alternating current and for amplifying those components of said intermediate output signal in the range of frequency of said alternating current;
  - means for rectifying the signal amplified by said bandpass filter means so that the presence of said line carrying alternating current is detected when said rectified signal exceeds a selected value; and
  - means for indicating that the presence of a line carrying alternating current is being detected by said means for detecting.

4,464,623
PROBE POINT DEVICE FOR ELECTRICAL TESTS

Michel Chamboa, Chassieu, France, assignor to Lucien Ferraz & Cie, Lyons, France

Filed Jul. 1, 1982, Ser. No. 394,342
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—72.5 7 Claims



1. In a probe point device for electrical tests, comprising an insulating push member having a longitudinal axis with a front and a rear end, with said front end carrying a metallic point and with said rear end having a terminal adapted to be connected with a cable, a hollow insulating head slidably mounted on said push member, means to resiliently maintain said head on said push member at a position of rest at which it wholly covers said metallic point, and a fuse cartridge disposed within said push member to connect said metallic point with said terminal, the improvement which consists in said cartridge being removable and replaceable and in locking means being provided to lock said push member with said head at said position of rest when said terminal and said point are not electrically connected with each other by said cartridge.

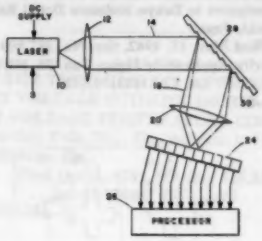
4,464,624
BROADBAND OPTICAL SPECTRUM ANALYZER

Johann M. Osterwalder, Encinitas, Calif., assignor to General Dynamics/Electronics Division, San Diego, Calif.

Filed Oct. 15, 1981, Ser. No. 311,787
Int. Cl.³ G01R *23/16*
U.S. Cl. 324—77 K 4 Claims

1. A broadband optical spectrum analyzer for analyzing an RF signal, comprising:
- injection laser means for generating a laser signal including a laser cavity;
- means for modulating said laser signal by introducing the RF signal to be analyzed into said laser cavity;
- means for collimating said modulated laser signal;
- reflecting means for reflecting said collimated laser signal with said laser signal components being reflected at different angles depending upon frequency content;
- a photodiode array;
- a transforming lens for focusing the laser rays of the same

spectral range from said laser signal to a single point on said photodiode array, each diode output corresponding



to a particular spectrum component of the RF signal being analyzed; and

parallel post processing means for analyzing the RF signal.

4,464,625

MAGNETORESISTIVE CURRENT DETECTOR

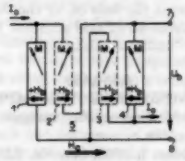
Heinz Lienhard, Zug; Jan Petr, Oberwil, and Benedikt Steinle, Zug, all of Switzerland, assignors to LGZ Landis & Gyr Zug AG., Zug, Switzerland

Filed Dec. 18, 1981, Ser. No. 331,981

Claims priority, application Switzerland, Dec. 24, 1980, 9567/80

Int. Cl.³ G01R 33/00, 33/02

U.S. Cl. 324—117 R 7 Claims



1. In a magnetoresistive current detector, including a conductor carrying a current to be measured generating an external magnetic field,

comprising in combination

two pairs of ferromagnetic and magnetoresistive thin films having hard and easy axes, respectively, and being connected to one another so as to constitute a Wheatstone bridge, said Wheatstone bridge being adapted to be fed by a supply current from a current- or voltage-source,

the thin films of each pair

being magnetostatically coupled to one another, so that the portion of the supply current flowing in each thin film of each pair generates an auxiliary magnetic biasing field having a direction along the hard magnetic axis of the other thin film of the same pair,

all of said films having substantially equal respective thicknesses, the thin films of each pair being superimposed to one another and separated by an insulating layer,

said external magnetic field having a direction along the direction of the hard magnetic axes of each of said thin films.

4,464,626

MOUNTING STRUCTURE FOR DIAL AND POINTER ELECTRICAL INSTRUMENTS

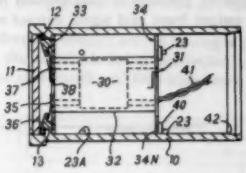
David E. Thomas, Enfield; David M. Jeffrey, Wormley, and David W. Simms, Bishops Stortford, all of England, assignors to Sangamo Weston Limited, Enfield, England

Filed Aug. 25, 1981, Ser. No. 296,044

Claims priority, application United Kingdom, Aug. 29, 1980, 8027945

Int. Cl.³ G01R 1/04

U.S. Cl. 324—156 14 Claims



1. A dial and pointer electrical instrument comprising a cylindrical housing, a movement having a pointer secured thereto, and a scale mounted in said cylindrical housing, a glass through which the pointer is read against the scale closing one end of the housing, a base closing the other end of the housing and carrying terminal structure through which electrical connection from outside the housing to said movement inside the housing is effected, said movement being attached to a mounting structure which positions said movement inside said cylindrical housing, said mounting structure comprising a plate which is a sliding fit inside said housing and carries a plurality of catches, each catch engaging releasably with cooperating structure inside said housing to prevent axial displacement of the movement and to retain said movement without mechanical attachment of said movement to said base.

4,464,627

DEVICE FOR MEASURING SEMICONDUCTOR CHARACTERISTICS

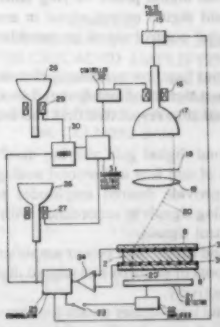
Chusuke Munakata; Kunihiro Yagi, both of Tokyo, and Teruaki Motooka, Yamanashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 1, 1981, Ser. No. 259,427

Claims priority, application Japan, May 1, 1980, 55-60409

Int. Cl.³ G01R 31/26

U.S. Cl. 324—158 R 7 Claims



1. A device for measuring semiconductor characteristics comprising: photon beam irradiation means which scans and irradiates the surface of a semiconductor specimen with a pulsed and converged photon beam; electrodes respectively disposed opposite front and back surfaces of said specimen

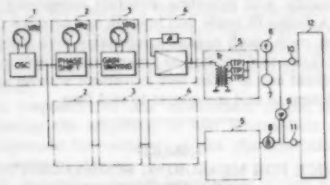
with a capacitive coupling gap being located between each electrode and the respective opposite surface of the specimen, through which photovoltage generated between the front surface and the back surface of said specimen by the irradiation with said photon beam is taken out by said electrodes, at least one of said electrodes located on the side irradiated with the said photon beam being capable of transmitting light; signal extract means for taking out only the signal components of said photovoltage by comparing the output signals taken out by said electrodes with pulsed signals and said photon beam; and observation means which displays said signal components relative to irradiated portions of said photon beam, so that changes in the output from said signal extract means can be observed.

4,464,628

RELAY TESTER

Teruo Nozawa, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1981, Ser. No. 318,100
Claims priority, application Japan, Nov. 7, 1980, 55-157442
Int. Cl.³ G01R *31/60*
U.S. Cl. 324—418 **8 Claims**



1. A relay tester, in which test signals are applied to a relay and wherein various characteristics of said test signals are varied over time, comprising:

a digital frequency varying unit for generating a digital output signal having a desired frequency determined in accordance with a first digital control signal;

first and second digital phase varying units for varying the phase of said digital output signal in accordance with a second digital control signal to provide a desired phase thereto;

first and second function generating circuits for converting digital output signals of said first and second digital phase varying units into respective first and second analog signals;

first and second digital gain varying units for varying the amplitudes of said first and second analog signals, respectively, to provide desired amplitudes to said first and second analog signals in accordance with respective third digital control signals;

first and second differential power amplifiers for amplifying analog outputs of said first and second digital gain varying units, respectively;

first and second transformer means for converting outputs of said first and second differential power amplifiers into voltage and current, respectively; and

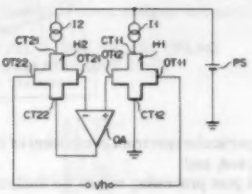
a control unit for digitally controlling said first and second digital phase varying units, first and second function generating circuits, first and second differential power amplifiers and first and second transformer means.

4,464,629

HALL ELEMENT DEVICE

Shikei Tanaka, Chigasaki, and Kunihiko Matsui, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 15, 1982, Ser. No. 357,809
Claims priority, application Japan, Jun. 26, 1981, 56-99354
Int. Cl.³ H03F *15/00*
U.S. Cl. 330—6 **9 Claims**



1. A Hall element device, comprising:

a plurality of Hall elements including a first and last Hall element, each said Hall element including a first input, a second input, a first output and a second output;

control current means, electrically connected to each said first input, for driving each said Hall element; and

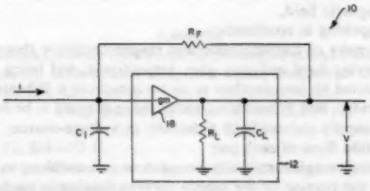
means, electrically connected between adjacent Hall elements, for maintaining said second output of the one adjacent Hall element and the first output of the other adjacent Hall element at the same potential and for preventing current from passing across the adjacent Hall elements, said means including a first input electrically connected to said second output of one said adjacent Hall element, a second input electrically connected to said first output of the other adjacent Hall element, and an output electrically connected to said second input of the other adjacent Hall element, whereby the voltage across the first output of the first Hall element and the second output of the last Hall element represents the sum of, or the difference between the voltages across all of said adjacent Hall elements.

4,464,630

TRANSIMPEDANCE PRE-AMPLIFIER

W. T. Eddins, West Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Mar. 7, 1980, Ser. No. 128,146
Int. Cl.³ H03F *1/36*
U.S. Cl. 330—107 **6 Claims**



1. A transimpedance amplifier comprising:

an operational amplifier circuit having an input capacitance and an output impedance;

a feedback resistor connected between the output and the input of said operational amplifier circuit, the product of the value of said feedback resistor and said input capacitance affecting the phase margin of said transimpedance amplifier; and

means, coupled to the output of said operational amplifier circuit, for compensating for the effect of the product of

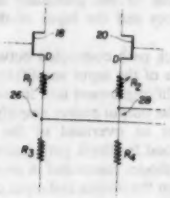
the value of said feedback resistor and said input capacitance on said phase margin while simultaneously controlling the bandpass characteristic of said transimpedance amplifier.

4,464,631

CIRCUIT FOR TRIMMING FET DIFFERENTIAL PAIR OFFSET VOLTAGE WITHOUT INCREASING THE OFFSET VOLTAGE TEMPERATURE COEFFICIENT

John S. Prentice, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Dec. 1, 1981, Ser. No. 326,345
Int. Cl.³ H03F *1/30, 3/45*
U.S. Cl. 330—253 **12 Claims**



1. A circuit for trimming the offset voltage of a differential amplifier and reducing post-trim offset voltage drift, comprising:

a pair of FET input transistors forming an input stage for a pair of inputs to said differential amplifier, each of said FET input transistors having a circuit-controllable drain-to-source current, the difference between said drain-to-source currents of said FET input transistors defining a drain-to-source current mismatch; an offset voltage of said differential amplifier being a function of said drain-to-source current mismatch and mismatches from among a plurality of non-controllable variables which characterize said FET, input transistors; and

an offset adjustment circuit for trimming said offset voltage, said offset adjustment circuit comprising an initial trimming network having a low temperature coefficient for reducing said offset voltage and a temperature-dependent resistive network of a substantially higher temperature coefficient for causing said drain-to-source current mismatch to track the decrease in said mismatches in said non-controllable variables as the ambient temperature of said circuit increases, said decrease in said drain-to-source current mismatch serving to automatically reduce said post-trim offset voltage drift.

4,464,632

VOLUME CONTROL CIRCUIT

Kozo Yoshihisa, and Isamu Okui, both of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Jun. 19, 1981, Ser. No. 275,155
Claims priority, application Japan, Jul. 8, 1980, 55/93047
Int. Cl.³ H03F *3/45;* H03G *3/30*
U.S. Cl. 330—254 **1 Claim**

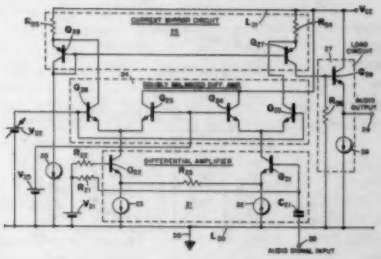
1. A volume control circuit having a pair of reference potential lines, an input terminal and an output terminal, said volume control circuit comprising:

a differential amplifier comprising first and second transistors, the emitter electrode of said first transistor being connected to the emitter electrode of said second transistor through a resistor and to one of said reference potential lines through a first constant current source, the emitter electrode of said second transistor being connected to said one reference potential line through a second constant current source;

a substantially doubly balanced differential amplifier comprising third, fourth, fifth and sixth transistors, the emitter electrodes of said third and fourth transistors being connected in common to the collector electrode of said first transistor, the emitter electrodes of said fifth and sixth transistors being connected in common to the collector electrode of said second transistor, the collector electrodes of said fourth and fifth transistors being connected in common to the other reference potential line;

a variable reference voltage source having a pair of terminals, one of the terminals being connected to the base electrodes of said third and sixth transistors, the other terminal being connected to said one reference potential line;

a fixed reference voltage source having a pair of terminals, one of the terminals being connected to the base electrodes of said fourth and fifth transistors, the other terminal being connected to said one reference potential line; and



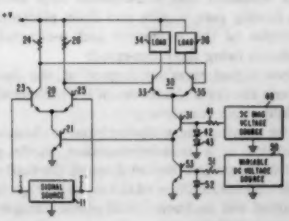
a current mirror circuit comprising seventh and eighth transistors, the emitter electrode of said seventh transistor being connected to the collector electrode of said third transistor and coupled to said other reference potential line, the emitter electrode of said eighth transistor being connected to the collector electrode of said sixth transistor and coupled to said other reference potential line, the base electrodes of said seventh and eighth transistors and the collector electrode of said eighth transistor being connected in common, the collector electrode of said seventh transistor being connected to said one reference potential line through a resistor and coupled to said output terminal, the collector electrode of said eighth transistor being connected to said one reference potential line through a third constant current source.

4,464,633

AMPLIFIER INCORPORATING GAIN DISTRIBUTION CONTROL FOR CASCADED AMPLIFYING STAGES

Leopold A. Harwood, Bridgewater, N.J., and Robert L. Shanley, II, Indianapolis, Ind., assignors to RCA Corporation, N.Y.

Filed Mar. 31, 1982, Ser. No. 363,869
Int. Cl.³ H03G *3/30*
U.S. Cl. 330—254 **10 Claims**



1. An amplifier comprising, in combination:

first and second signal amplifying stages connected in cascade; and

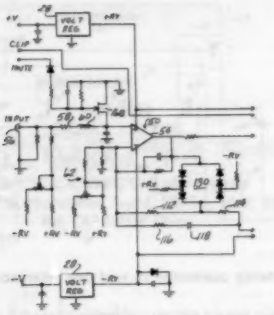
means coupled to said first and second signal amplifying stages for simultaneously varying the respective gains of said first and second signal amplifying stages in mutually opposite directions in such manner as to alter the distribution of gain between said stages substantially without disturbance of the overall gain of said amplifier.

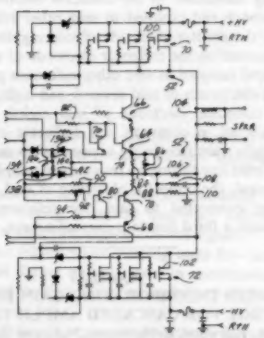
4,464,634

AUDIO POWER AMPLIFIER

Juan F. Velazquez, Saline, Mich., assignor to VSP Labs, Inc., Ann Arbor, Mich.

Filed Jun. 10, 1982, Ser. No. 386,944
Int. Cl.³ H03F 3/30
U.S. Cl. 330—264 **1 Claim**





1. An audio power amplifier comprising:

input amplifying means having an input for receiving an audio frequency signal and an output;

output power amplifying means including a p-channel field effect transistor and a n-channel field affect transistor, each having gate, source and drain electrodes, the drain electrodes of the p-channel and n-channel field effect transistors being interconnected;

an output signal terminal formed at the interconnection between the drain electrodes of the p-channel and n-channel field effect transistors;

means for driving the p-channel and n-channel field effect transistors in a transconductance mode of operation wherein the output current through the field effect transistors is a direct function of the input voltage applied to the p-channel and n-channel field effect transistors; the driving means including:

means for providing first and second voltage sources, the first voltage source being applied to the source electrodes of the p-channel and n-channel field effect transistors;

first and second transistors connected to the output of the input amplifying means, the second voltage source being applied to the first and second transistors:

first and second drive transistors responsive to the output of the first and second transistors, respectively, for generating a current proportional to the voltage of the audio frequency input signal;

means for converting the current to a voltage and applying the voltage to the p-channel and n-channel field effect transitors to generate an output current through the p-channel and n-channel field effect transistors which is a direct function of the voltage applied thereto;

a first feedback path connected between the interconnected drain electrodes of the p-channel and n-channel field effect transistors and the input of the input amplifying means; and

a second feedback path connected between the output and input terminals of the input amplifying means for biasing the input amplifying means into linear operation prior to the return of the output power amplifying means to linear operation after an overload of the output amplifying means the second feedback path including:

first and second diodes connected in reverse parallel configuration between the output and input of the input amplifying means;

a plurality of auxiliary diodes connected in series with each of the first and second diodes; and

reverse bias reference voltages connected to the junctions between the first and second diodes and each auxiliary diode series;

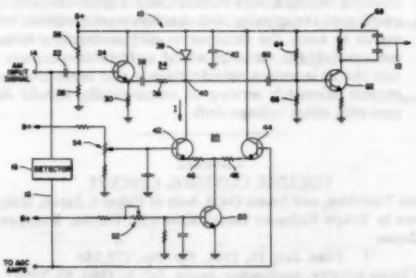
the auxiliary diodes and the reverse bias reference voltages providing a reverse bias requiring an increased voltage across the first and second diodes before the first and second diodes will conduct.

4,464,635

NON-REACTIVE LIMITER

Jouke N. Rypkema, Lombard, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Nov. 18, 1982, Ser. No. 442,543
Int. Cl.³ H03G 3/30
U.S. Cl. 330—284 **6 Claims**



1. An amplitude limiter for removing the modulation from a carrier signal amplitude modulated by a modulating signal comprising:

detecting means responsive to the carrier signal for providing a replica of the modulating signal;

a voltage divider including fixed resistance means and variable resistance means;

means for applying the amplitude modulated carrier signal across the voltage divider; and

means responsive to the detected replica of the modulating signal for linearly varying the variable resistance in accordance with the instantaneous amplitude thereof so as to develop a carrier signal across the variable resistance

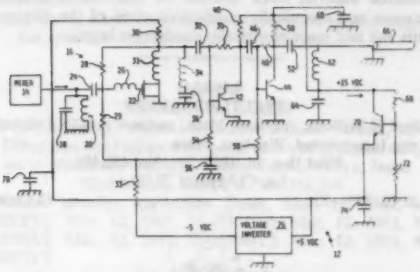
which is substantially free of both amplitude and angle modulation.

4,464,636

WIDEBAND IF AMPLIFIER WITH COMPLEMENTARY GAAS FET-BIPOLAR TRANSISTOR COMBINATION

Pierre Dobrovolny, North Riverside, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jan. 5, 1983, Ser. No. 455,724
Int. Cl.³ H03F 3/16
U.S. Cl. 330—300 **9 Claims**



1. A wideband, high gain intermediate frequency (IF) amplifier comprising:

a first portion having a field-effect transistor input stage wherein gain peaking thereof is at the high frequency end of an IF band;

a section portion having a plurality of bipolar transistors wherein the frequency versus gain characteristic thereof decreases at the high frequency end of said IF band; and

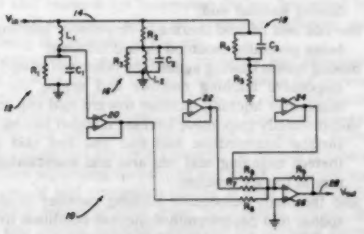
an equalization network coupling said first and second portions for matching said first and second portions at said high frequency end of the IF band and wherein said first and second portions are mismatched at lower frequencies in said IF band in providing equalized amplifier gain over a wide frequency band.

4,464,637

SEMI-ACTIVE NOTCH FILTER

Daniel G. Jablonski, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 30, 1982, Ser. No. 445,777
Int. Cl.³ H03F 3/68
U.S. Cl. 330—426 **10 Claims**



1. A "semi-active" notch filter having an input signal line and an output signal terminal for selectively altering signal components in an input signal(s) $V_{in}(f)$ at the input signal line to have predetermined gain and phase characteristics in three frequency ranges FR1, FR2 and FR3, and in the frequency range between the frequency ranges FR1 and FR2 in the form of an output signal(s) $V_{out}(f)$ at the output signal terminal, wherein frequency range FR3 corresponds to second harmonics of signal components in frequency range FR2 and frequency ranges FR2 and FR3 are much greater than frequency range FR1, said "semi-active" notch filter comprising:

a passive quasi low-pass filter portion connected at its input to the input signal line for selectively altering at its output the signal components of the input signal(s) $V_{in}(f)$ in the frequency ranges FR1, FR2 and FR3, and in the frequency range between the frequency ranges FR1 and FR2, the phase characteristic of said passive quasi low-pass filter portion exhibiting variations typical of a second order low-pass filter, as opposed to the phase characteristic of a first order low-pass filter;

a passive band-pass filter portion connected at its input to the input signal line for selectively altering at its output the signal components of the input signal(s) $V_{in}(f)$ in the frequency ranges FR1, FR2 and FR3, and in the frequency range between the frequency ranges FR1 and FR2;

a passive quasi high-pass filter portion connected at its input to the input signal line for selectively altering at its output the signal components of the input signal(s) $V_{in}(f)$ in the frequency ranges FR1, FR2 and FR3, and in the frequency range between the frequency ranges FR1 and FR2, said passive quasi high-pass filter having non-zero signal gain at zero signal frequency; and

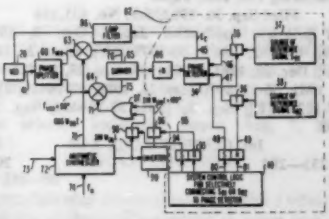
means operatively connected at its input to the outputs of said passive quasi low-pass filter portion, said passive band-pass filter portion and said passive quasi high-pass filter portion for summing the selectively altered signal components of the input signal(s) $V_{in}(f)$ in the frequency ranges FR1, FR2 and FR3, and in the frequency range between the frequency ranges FR1 and FR2; said means for summing providing at the output signal terminal of said "semi-active" notch filter the output signal(s) $V_{out}(f)$ characterized by a notch filter response in the frequency range FR2, a phase shift of substantially zero in the frequency range FR1 and greatly attenuated signal components in the frequency range FR3.

4,464,638

UNIVERSAL DIGITAL FREQUENCY SYNTHESIZER USING SINGLE SIDE BAND TECHNIQUES

Albert T. Crowley, Somerdale, and Robert M. Lisowski, Cherry Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 30, 1981, Ser. No. 326,136
Int. Cl.³ H03L 7/18
U.S. Cl. 331—1 A **4 Claims**



1. In a phase locked loop frequency synthesizer having a loop bandwidth of X KHz and comprising a voltage controlled oscillator (VCO) for generating a signal S_{VCO} of frequency f_{VCO}, means for selectively increasing or decreasing f_{VCO} by a variable frequency f_{AS} whose minimum value ≧MX KHz, and where M>1, to selectively produce a spectrum of signals of frequencies ($f_{VCO}\pm f_{AS}$), means for dividing the frequencies ($f_{VCO}\pm f_{AS}$) by N to produce a signal S_N of frequency $f_N=(f_{VCO}\pm f_{AS})/N$, means for generating a first reference signal S_{R1} of frequency f_{R1}, logic including phase comparing

means for comparing S_N with S_{R1} to produce a control signal E_c, said VCO being responsive to E_c to alter its frequency so that $(f_{VCO} \pm f_{AS})/N = f_{R1}$;

means for generating a second reference signal S_{R2} of frequency f_{R2}, where $(Nf_{R2} + M\ KHz) \leq Nf_{R1} - M\ KHz$; and

means for supplying S_{R2} to said phase comparing means in lieu of S_{R1}.

4,464,639

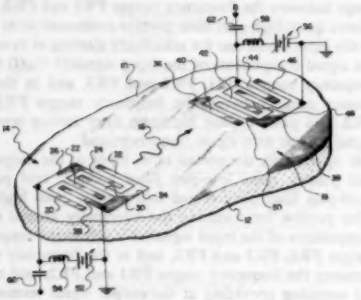
FERROELECTRIC SURFACE ACOUSTIC WAVE DEVICES

Edward J. Staples, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 17, 1982, Ser. No. 419,272

Int. Cl.³ H03H *9/145, 9/64, 9/68*

U.S. Cl. 333—154 **3 Claims**



1. A surface acoustic wave device, comprising:

a ferroelectric strontium barium niobate crystal having a plurality of ordered domains of alternating polarity;

an output interdigital transducer, including at least one pair of electrodes, disposed on a surface of said crystal, each of said electrode pairs corresponding to one of said domains;

an input interdigital transducer disposed on said surface and oriented to direct a surface acoustic wave toward said output transducer.

4,464,640

DISTRIBUTION CONSTANT TYPE FILTER

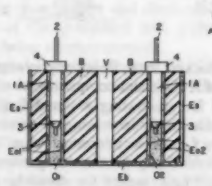
Toshio Nishikawa, Nagaokakyo; Sadahiro Tamura, and Hiroshi Tamura, both of Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Sep. 30, 1982, Ser. No. 431,184

Claims priority, application Japan, Oct. 2, 1981, 56-147529[U]; Oct. 2, 1981, 56-147530[U]; Oct. 2, 1981, 56-147531[U]; Dec. 28, 1981, 56-211595; Dec. 28, 1981, 56-211596; Dec. 28, 1981, 56-211597; May 24, 1982, 57-76421[U]; Jul. 6, 1982, 57-102947[U]; Sep. 3, 1982, 57-154434; Sep. 3, 1982, 57-154435

Int. Cl.³ H01P *1/205, 7/04*

U.S. Cl. 333—202 **29 Claims**



1. A distribution constant type filter which comprises a dielectric material block member made of a dielectric material provided with at least a pair of through-openings formed in said dielectric material block member side by side, at a predetermined interval therebetween, inner electrically conductive layers respectively formed on inner peripheral faces of said through-openings, an outer electrically conductive layer provided at least on four side faces of said dielectric material block member so as to form at least a pair of neighboring resonance units thereby, and at least a pair of dielectric units each provided with a columnar portion formed by applying a dielectric material onto part of an electrically conductive wire so that said electrically conductive wire axially extends therethrough, and respectively inserted into said through-openings of said dielectric material block member for electrostatic coupling between said electrically conductive wires of the dielectric units and said inner electrically conductive layers.

4,464,641

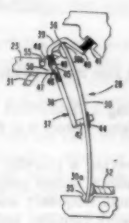
CIRCUIT BREAKERS

Alfred H. Bellows, Wayland, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 16, 1982, Ser. No. 450,486

Int. Cl.³ H01H *75/12*

U.S. Cl. 335—23 **12 Claims**



1. A circuit breaker comprising

a housing of insulating material;

a fixed contact mounted in said housing;

a contact carrier with a movable contact thereon;

operating means for manually moving said contact carrier to selectively move said movable contact between a closed position and an open position with respect to said fixed contact;

a trip arm pivotally mounted in said housing and movable from a set position to a tripped position;

a load terminal;

a thermally responsive latching member connected in circuit between said load terminal and said movable contact, said thermally responsive latching member having one end and having another end;

the one end of said thermally responsive latching member being pivotally mounted in said housing;

biasing means bearing against the other end of said thermally responsive latching member and urging the thermally responsive latching member toward said trip arm;

said thermally responsive latching member having a latching surface intermediate said one end and said other end thereof engaging said trip arm and maintaining said trip arm in the set position;

said thermally responsive latching member bending in response to a predetermined current condition to move the latching surface intermediate said one end and said other end of the thermally responsive latching member and disengage said latching surface from said trip arm releasing said trip arm for movement to the tripped position;

movement of the trip arm to the tripped position causing said contacts to open;

wherein said thermally responsive latching member includes an elongated thermally responsive element having one end and having another end;

the one end of said elongated thermally responsive element being pivotally mounted in said housing;

an armature element having an arm disposed generally parallel to the elongated thermally responsive element, said arm having one end and having another end, means adjacent to the one end of said arm for constraining the other end of the elongated thermally responsive element, and means adjacent to the other end of said arm for constraining said other end of the arm with respect to the central portion of the elongated thermally responsive element;

said latching surface of said thermally responsive latching member being located in said arm intermediate the one end and the other end thereof;

and wherein

said biasing means bears against the armature element urging the armature element toward said trip arm.

4,464,642
CIRCUIT BREAKER

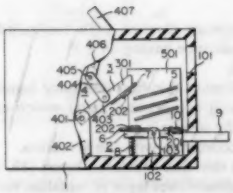
Shinji Yamagata; Fumiyuki Hisatsune; Junichi Terachi, all of Fukuyama, and Hajimu Yoshiyasu, Itami, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1982, Ser. No. 356,144

Claims priority, application Japan, Mar. 12, 1981, 56-35552[U]; Mar. 12, 1981, 56-35554[U]; Mar. 12, 1981, 56-35555[U]; Mar. 12, 1981, 56-35556[U]; Mar. 12, 1981, 56-35557[U]

Int. Cl.³ H01H *9/30*

U.S. Cl. 335—201 **5 Claims**



1. A circuit breaker comprising:

a pair of contactors, one of said contactors being a movable contactor and having the entire contactor relatively movable away from and toward the other contactor to open and close an electric circuit, each of said contactors having a conductor and a contact secured thereto, said contacts abutting each other when said conductors are close to each other;

arc shields of a material having a resistivity greater than the material of said conductors and said contacts, one positioned on each of said contactors surrounding the periphery of said contacts for narrowing the arc generated between said contacts when said contacts separate, and increasing the pressure in the arc;

means connected to said movable contactor and responsive to the flow of current through said contacts for moving said movable contactor away from the other contactor when a flow of short circuiting current flows through said contacts and said means, said means having an inertia which causes said movable contactor to have a comparatively low separating speed from said other contactor; and

at least one of said contactors having at least a part of the conductor which extends from the contact toward the other end thereof pivotally mounted for pivoting movement away from the contact position of said contacts and spring means urging said pivotally mounted part of the conductor toward the contact position with a force less than that which can be overcome by the pressure in the narrowed arc, said pivotally mounted part being pivotable away from the opposed contact due to the arc pressure faster than said current flow responsive means moves said movable contactor away from said other contactor.

4,464,643
DEVICE FOR DISPLAYING TELEVISION PICTURES AND DEFLECTION UNIT THEREFOR

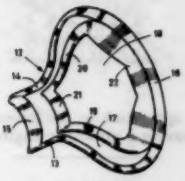
Hans Meershoek, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 14, 1983, Ser. No. 474,867

Claims priority, application Netherlands, Jan. 6, 1983, 8300031

Int. Cl.³ H01F *5/00*

U.S. Cl. 335—213 **10 Claims**



1. In a device for displaying television pictures comprising a display tube in the neck of which an electron gun system is present for emitting at least one electron beam towards a display screen, and comprising a deflection unit which is mounted coaxially around the display tube, said deflection unit comprising a line deflection coil system which upon energization deflects the electron beam in a first direction and a frame deflection coil system which upon energization deflects the electron beam in a direction transverse to the first direction, said frame deflection coil system comprising two frame deflection coils of the saddle type situated diametrically with respect to each other, each frame deflection coil comprising a number of conductors which are wound so as to produce first and second side packets extending in the longitudinal direction of the deflection unit, an arc-shaped first front end section and an arc-shaped first rear end section which together define a first window the improvement wherein each frame deflection coil also comprises further conductors which are wound to produce third and fourth side packets, an arc-shaped second front end section and an arc-shaped second rear end section which together define a second window which is situated within the first window, said window being shaped to produce, in combination with said first window, a pin-cushion shaped deflection field at the end thereof toward said gun system and a central longitudinal barrel-shaped deflection field.

4,464,644
PROCELAIN-CLAD ELECTRICAL MACHINE WITH VIBRATION-ON-TRANSPORTATION SUPPRESSION

Takeo Fukatsu, Takarazuka, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 8, 1983, Ser. No. 521,360

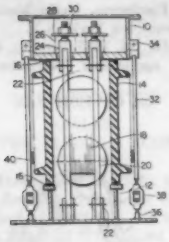
Claims priority, application Japan, Aug. 7, 1982, 57-120674[U]

Int. Cl.³ H01F *27/02*

U.S. Cl. 336—90 **3 Claims**

1. A porcelain-clad electrical machine with a vibrations-on-transportation suppression comprising an upper tank, a lower tank, a hollow porcelain tube connected at both ends to the upper and lower tanks through packings respectively, an electrical machine fixed between a pair of electrically insulating plates extending through the interior of the procelain tube, a compression controlled helical spring disposed in the upper tank to controllably tension an associated one of the electrically insulating plates with respect to the lower tank and also to apply to the packings surface pressures sufficient to assemble the upper and lower tanks and the electrically insulating plates with the electrical machine into a unitary structure, and

at least three supporting rods disposed at predetermined equal angular intervals on the outside of the porcelain tube to connect and fix the upper tank to the lower tank, each of the supporting rods having a adjustable length.



4,464,645

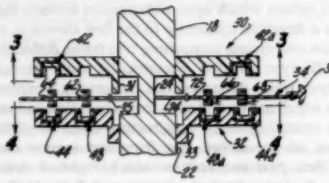
ANGULAR DISPLACEMENT TRANSDUCER OF THE VARIABLE RELUCTANCE TYPE

Peter Norton, 170 Beaver Brook, Lincoln Park, N.J. 07035

Filed Aug. 6, 1982, Ser. No. 405,786

Int. Cl.³ H01F *21/06*

U.S. Cl. 336—135 **11 Claims**



1. An angular displacement transducer of the variable reluctance type comprising,

first and second members having opposed faces and having a common axis of symmetry, at least one of said members being rotatable about said axis,

a first and second set of cores, one-half of each set being on the first member and one-half of each set being on the second member, each core terminating in spaced pole faces,

a pair of cores in the first set, one on each member, coacting with each other to provide a first magnetic circuit with an air gap between the pole faces thereof,

a pair of cores in the second set, one on each member, coacting with each other to provide a second magnetic circuit with an air gap between the pole faces thereof,

a first conductor coil disposed adjacent each pair of cores of the first set and magnetically linked with the magnetic circuit thereof,

a second conductor coil disposed adjacent each pair of cores of the second set and magnetically linked with the magnetic circuit thereof,

the pole faces of each pair of cores of the first set being positioned on the respective first and second members so that relative rotation of said members from first to second predetermined angular positions causes the degree of face-to-face overlap of said pole faces to decrease, whereby the reluctance of the magnetic circuit of each pair of cores is increased,

the pole faces of each pair of cores of the second set being positioned on the respective first and second members so that relative rotation of said members from said first to said second predetermined angular position causes the degree of face-to-face overlap of said pole faces to increase, whereby the reluctance of the magnetic circuit of each pair of cores is decreased.

4,464,646

CONTROLLED TEMPERATURE COEFFICIENT THIN-FILM CIRCUIT ELEMENT

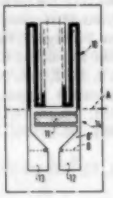
Kurt Burger, Friolzheim; Heinz Friedrich, Stuttgart; Heiko Gruner, Gerlingen; Karl-Otto Linn, and Erich Zabler, both of Karlsruhe, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 7, 1981, Ser. No. 281,169

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1980, 3029446

Int. Cl.³ H01C *7/06, 1/12*

U.S. Cl. 338—25 **11 Claims**



1. Thin-film circuit element with controlled temperature coefficient of resistance having

a substrate (9);

at least two distinct thin-film resistance layers (10, 11, 15), each of which comprises a metal which can be etched, applied to the substrate

wherein, in accordance with the invention,

the respective thin-film resistance layers (10, 11, 15, 25, 26) comprise a continuous layer of tantalum on the substrate;

and a thin-film layer of nickel located over a portion of said layer of tantalum,

to form a tantalum-nickel resistance layer providing a temperature-dependent resistor (R_{TaNi}), (10, 26), and

a tantalum-only resistance layer providing an essentially temperature-independent resistor (R_{Ta}), (11, 15; 25),

and wherein the respective thin-film resistors have individually different temperature coefficients of resistance (R_{TaNi}; R_{Ta}) to provide said circuit element with a temperature coefficient of resistance (RTC) which is controlled to have a predetermined value.

4,464,647

HUMIDITY SENSOR MADE OF METAL OXIDE

Yuji Yokomizo, Nagai; Keiji Yuuki, Takahata, and Naoe Watanabe, Nagai, all of Japan, assignors to Marcon Electronics Co. Ltd., Nagai and Japan Electronic Industry Development Association, Mianto, both of, Japan

Filed Jan. 25, 1982, Ser. No. 342,225

Claims priority, application Japan, Feb. 12, 1981, 56-19758; May 8, 1981, 56-69584; May 8, 1981, 56-69585

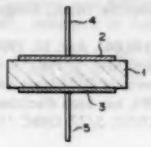
Int. Cl.³ H01B *1/00*

U.S. Cl. 338—35 **7 Claims**

1. A metal oxide humidity sensor comprising:

a sintered body having an average particle size less than 7 μm and comprising 69.95 to 30 mol % of ZnO, 29.95 to 50 mol % or Cr_2O_3, 0.05 to 10 mol % of V_2O_5 and 0.05 to 10 mol % of M_2O where M_2O is at least one metal oxide

selected from the group consisting of Li_2O, Na_2O and K_2O; and



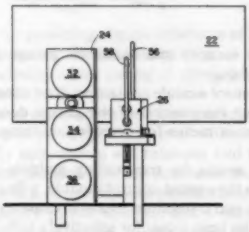
a pair of electrodes each electrode being attached to a surface of said sintered body.

4,464,648

DISPLAY PANEL FOR AIRCRAFT PARKING

Cecil B. Smith, Tucker, and Finis E. Fox, East Point, both of Ga., assignors to Delta Airlines, Inc., Atlanta, Ga.

Filed Jul. 20, 1981, Ser. No. 285,208
Int. Cl.³ B64F 1/22
U.S. Cl. 340—51 **9 Claims**



1. A display panel for aircraft parking comprising:

A. an opaque background panel, supported exteriorly of an aircraft terminal building;

B. a vertically oriented signal light display housing, including red, yellow and green signal lights, said display housing being mounted upon said background panel, such that a portion of said housing extends below said background panel;

C. a parking light display housing, including a first neon tube of one color and a second neon tube of another color, supported upon said background panel adjacent said signal light display housing, such that said first neon tube and said second neon tube are linearly separated in an axis perpendicular to said background panel, yet aligned in vertical parallel with said red, yellow and green signal lights; and

D. a source of electricity operably connected to said neon tubes, as an aircraft alignment guide, and operably connected to said signal light, as an aircraft advance and stopping guide.

4,464,649

ELECTRONIC BRAKING ALARM INDICATOR FOR AUTOMOBILES

Wina Shin Her, 15, Chien Ming Rd., Win Lin Li, Peitou District, Taipei, Taiwan

Filed Feb. 22, 1982, Ser. No. 350,701
Int. Cl.³ B60Q 1/26
U.S. Cl. 340—72 **7 Claims**

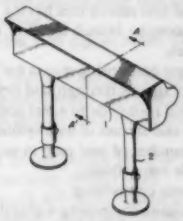
1. An electronic braking alarm indicator for automobiles comprising

a plurality of bulbs, each positioned to light one of the letters S, T, O, P, S on a display screen, said first bulb lighting the first letter S, said second bulb lighting the letter T, said third bulb lighting the letter O, said fourth bulb lighting the letter P, and said fifth bulb lighting the last letter S,

a voltage source for lighting said bulbs,

first and second switches connected to said voltage source, said first switch connected to operate with a foot brake of the automobile,

first unidirectional current means connected in the line from said first switch to said first and third bulbs,



second unidirectional current means connected to said switches,

flashing means connected to said second unidirectional current means and to said plurality of bulbs,

third unidirectional current means connected to said fifth bulb and said first and third bulbs,

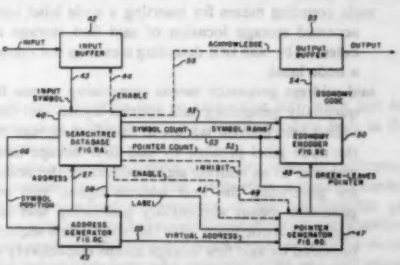
said second switch connected to said fifth bulb and through said third unidirectional means to said first and third bulbs.

4,464,650

APPARATUS AND METHOD FOR COMPRESSING DATA SIGNALS AND RESTORING THE COMPRESSED DATA SIGNALS

Willard L. Eastman, Lexington, Mass.; Abraham Lempel; Jacob Ziv, both of Haifa, Israel, and Martin Cohn, Arlington, Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,870
Int. Cl.³ H03K 13/00
U.S. Cl. 340—347 DD **244 Claims**



1. A data compression and decompression system for compressing digital data and recovering the original data from the compressed data, said system including means for reading the digital data from a medium to provide a stream of data symbol signals, said data symbol signals being members of an alphabet of symbol signals comprising a predetermined number of symbol signals, said system including compression apparatus responsive to said stream of data symbol signals for providing a compressed stream of code signals corresponding thereto and applying said code signals to a medium, said system further including decompression apparatus responsive to said code signals for recovering the original data therefrom, said compression apparatus comprising:

means for parsing said stream of data symbol signals into segments, each segment comprising a prefix and the next

data symbol signal occurring in said stream after said prefix, said prefix comprising the longest match with a previous segment, said parsing means defining a first search tree having nodes and branches emanating from said nodes, each node having at most one incoming branch, the outgoing branches emanating from a node being representative of said symbol signals of said alphabet, respectively, said nodes having respective node labels associated therewith and respective addresses associated therewith, said first search tree having a unique root node without an incoming branch and leaf nodes without outgoing branches,

said parsing means comprising means for tracing said stream of data symbol signals through said first search tree along a path from said root node to a leaf node, including means responsive to said stream of data symbol signals for determining the branches of said path in accordance with said symbol signals respectively,

said parsing means comprising

first storage means comprising a plurality of storage locations corresponding respectively to said addresses of said nodes of said tree, said storage locations being utilized for storing said node labels, a node label stored at a particular storage location identifying the node whose address corresponds to said particular storage location,

address generator means for generating an address signal and for providing said address signal to said first storage means for accessing said storage locations thereof, said first storage means providing, in response thereto, the node label stored in the storage location accessed by said address signal, said address generator means being responsive to a node label provided by said first storage means and to a data symbol signal from said stream of data symbol signal for generating said address signal in accordance therewith,

first detecting means for detecting when an accessed storage location of said first storage means does not contain a node label, said storage location not containing a node label defining a leaf node of said first search tree, and

node counting means for inserting a node label into said accessed storage location of said first storage means detected by said first detecting means as not containing a node label;

said address generator means comprising means for sequentially generating said address signals and for providing said address signals to said first storage means, the node label proided by said first storage means in response to an address signal providing the node label for generating the next address signal, said address generator means sequentially generating said address signals in accordance with the node labels sequentially provided by said first storage means respectively and in accordance with successive symbol signals of said stream of data symbol signals respectively, said address generator means sequentially generating said address signals until said first detecting means detects an accessed storage location of said first storage means without a node label; and

means responsive to the address of said accessed storage location not containing a node label for generating a pointer signal in accordance therewith for each said segment, said pointer signal being representative of said previous segment matching said prefix and of said next occurring data symbol signal after said prefix,

thereby providing pointer signals for segments of said stream of data symbol signals, respectively,

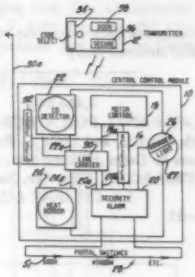
said pointer signals comprising said compressed stream of code signals.

4,464,651

HOME SECURITY AND GARAGE DOOR OPERATOR SYSTEM

Dean C. Duhame, Roseville, Mich., assignor to Stanley Vemco, Detroit, Mich.

Division of Ser. No. 140,045, Apr. 14, 1980, Pat. No. 4,360,801.
This application Mar. 1, 1982, Ser. No. 353,551
The portion of the term of this patent subsequent to Nov. 23, 1999, has been disclaimed.
Int. Cl.³ G08B *19/00, 5/22;* G08C *19/00;* E05F *15/20*
U.S. Cl. 340—521 **6 Claims**



1. A home security and automatic garage door operator system comprising:

a central control module containing door actuator means for controlling the position of the garage door and security alarm circuit means for detecting unwanted entry into a building;

transmitter means for transmitting multiple-bit pulse train signals to the central control module, a first user actuated means on said transmitter means to cause a transmission of a first pulse train signal for selectively activating the door actuator means and a second user-actuated means on said transmitter means to cause transmission of a second pulse train relsted to the first pulse train for placing said security alarm circuit means in a set condition and to disable the door actuator means;

said central control module further comprising receiver means, a plurality of code select switches coupled to said receiver means and operative to define a security code for the receiver;

channel monitoring means for detecting a characteristic of a control portion of the transmitted pulse train signal from sad transmitter means to said central control module and operative to generate respective output signals to said security alarm and said door actuator means in accordance with said characteristic,

said control portion being a particular bit in the transmitted pulse train and said characteristic being the value of said bit;

said channel monitoring means comprising bi-stable means having at least first and second output lines, oscillator means coupled to said bi-stable means for toggleing the state of said first and second output lines, means for coupling said first output lines to said receiver means and operative to simulate a code select switch associated with said particular bit in the pulse train, said receiver generating a local pulse train including a security code portion as defined by the condition of said code select switches and an associated control bit, the state of which is determined by the first line of the bi-stable means,

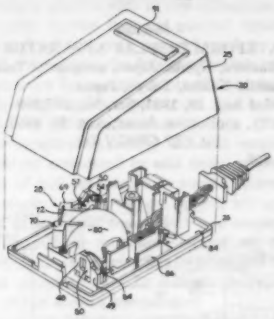
means for disabling further toggleing of said bi-stable means when the receiver generates a matched output signal indicating the detection of a match between the local and transmitted pulse trains whereby the state of the output lines of the bi-stable means provides an indication of the state of the control bit in the transmitted pulse train.

4,464,652

CURSOR CONTROL DEVICE FOR USE WITH DISPLAY SYSTEMS

William F. Lapson, Cupertino, and William D. Atkinson, Los Gatos, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Jul. 19, 1982, Ser. No. 399,704
Int. Cl.³ G09G 1/00
U.S. Cl. 340—710 **13 Claims**



1. A device for providing signals indicative of X-Y locations on a display system or the like, comprising:

a housing including a base having an opening for the passage of a rotatable ball;

a unitary frame disposed on said base including:

a domed portion integrally formed with said frame substantially surrounding and retaining said rotatable ball;

said domed portion having first and second cut-outs through said dome disposed substantially at 90 degrees with respect to one another, and a third cut-out disposed at an angle with respect to said first and second cut-outs;

X-Y position indicating means passing through said first and second cut-outs, for converting the rotation of said ball into signals indicative of X-Y positions on said display system;

biasing means passing through said third cut-out, for biasing said ball against said X-Y position indicating means;

means for removing said ball from said domed portion through said opening in said base, such that said ball and the interior or said dome may be serviced, said means for removing comprising:

outwardly extending lock ridges integrally formed with said opening in said base;

a lock cap having a second opening of smaller diameter then said base opening to permit only a portion of said ball to pass therethrough and contact said surface;

said lock cap further including outwardly extending lock tabs to interleaf with said lock ridges, such that rotation of said cap interleafs with said tabs and ridges thereby locking said cap onto said base;

whereby movement of said device over a surface such that a portion of said ball is maintained in contact with said surface results in X-Y positions defined on said display system.

4,464,653

COMBUSTIBLE GAS DETECTION SYSTEM

Joe K. Winner, Pinellas, Fla., assignor to The Bendix Corporation, Southfield, Mich.

Filed Dec. 9, 1981, Ser. No. 328,779
Int. Cl.³ G08B 23/00; G08C 19/16
U.S. Cl. 340—501 **7 Claims**

1. A combustible gas detection system comprising, a sensor module located at a site to be monitored for combustible gas, said sensor module including,

a combustible gas sensor providing an analog signal related to the concentration of combustible gas to which it is exposed;

means for converting said analog signal to a digital signal representing the numerical value of said analog signal, and

means for transmitting said digital signal as a digital word having a predetermined serial data format; and

a controller remotely located from said sensor module, said controller including,

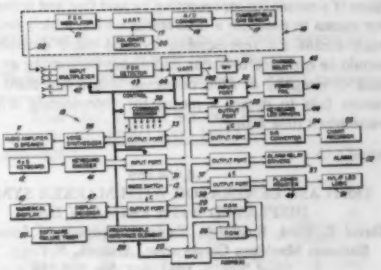
means for receiving said digital word transmitted by said sensor module;

means for testing the time duration of said received digital word to determine whether said time duration acceptably conforms to the time duration of said predetermined serial data format;

means providing the difference in value between two said digital words successively received;

means for testing said difference against a fixed value representing the maximum acceptable change between two said successive words;

means operable upon failure of said received words to meet



said time duration test or said value difference test for providing a failure warning identifying data fault as the cause of failure;

computing means including a memory wherein calibration constants are stored, said calibration constants having been determined by exposure of said combustible gas sensor to gases of known concentrations of combustibles;

means applying said received word to said computing means for calculation from said received word and said stored calibration constants of the concentration of combustible gas present at said sensor module;

means for testing said calculated concentration against a predetermined range of probable values for such concentrations obtainable from a normal combustible gas sensor;

means operable when said calculated concentration is outside said predetermined range of probable values for providing a failure warning identifying said combustible gas sensor as the cause of failure;

means for comparing said calculated concentration with a predetermined alarm set point;

means providing an alarm signal whenever said calculated concentration exceeds said alarm set point; and

means for displaying said calculated concentration of combustible gas.

4,464,654

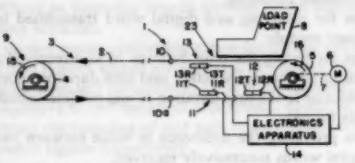
TIME INDEPENDENT LOGIC SYSTEM FOR RIP DETECTORS

Richard G. Klein, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 246,140, Mar. 23, 1981. This application Dec. 29, 1982, Ser. No. 454,337

Int. Cl.³ G08B 21/00

U.S. Cl. 340—676 **40 Claims**



1. A rip detector apparatus for a conveyor, including means for representing the integrity of such conveyor and means for moving such conveyor, comprising first, second and third detector means for detecting said means for representing as an indication of integrity of the conveyor belt, said first, second and third detector means being a predetermined distance from each other, means for sensing the time period between detections of a means for representing by said first and second detector means to establish a time frame within which detection of such means for representing by said third detector means would be expected to occur, and means for sensing an apparent lack of integrity of such conveyor when said third detector means fails to detect a means for representing within said established time frame.

4,464,655

TESTCASE GENERATOR WITH MARKER SYMBOLS DISPLAYED WITH PRIMARY DATA

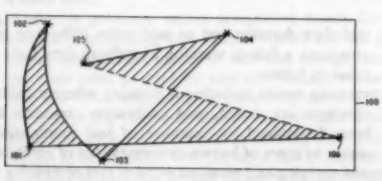
David L. Bird, Eastleigh, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 5, 1981, Ser. No. 318,296

Claims priority, application European Pat. Off., Nov. 26, 1980, 80304231

Int. Cl.³ G09G 1/00

U.S. Cl. 340—715 **3 Claims**



1. In a digital data display system including a data processing device, a data store, a program executable in the data processing device for constructing alphanumeric and graphic data displays in the data store in response to statements, and a display terminal screen at which the display is presented,

a testcase generator for generating testcase statements to be executed by said program for constructing displays, said testcase statements including statements for primary data to be displayed,

wherein the improvement comprises,

means in the testcase generator to generate statements for secondary data including marker symbols visually distinctive from said primary data and arranged to appear to test personnel in a selected separate position relative to the primary data on the display terminal when the program for constructing displays has executed properly,

whereby when the primary data and secondary data are displayed during the execution of the testcase program by said means for constructing displays, if a marker symbol is not in its selected position relative to the primary data, an error condition in processing the testcase program by said program for constructing displays is indicated.

4,464,656

WAVEFORM DISPLAY APPARATUS

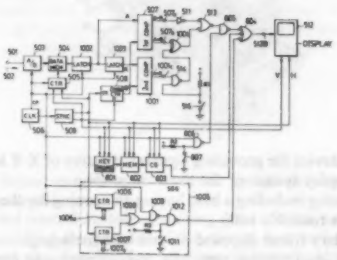
Masakazu Nakamura, Gyoda, Japan, assignor to Takeda Riken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1981, Ser. No. 297,260

Claims priority, application Japan, Aug. 29, 1980, 55-120113

Int. Cl.³ G09G 1/00

U.S. Cl. 340—728 **30 Claims**



1. A waveform display apparatus comprising:

a raster scan-type display unit having a horizontal input, a vertical input, a video signal input, a display surface having a specified number of main scanning lines, each of said main scanning lines having a specified number of picture elements, said display surface being raster scanned in accordance with said video signal input, each of said picture elements being optically displayed on the scanned display surface;

a data memory for storing digital data to be displayed, said data memory having a specified number of addresses corresponding to a specified number of storage locations, said specified number of addresses being the same as said specified number of picture elements of one of said main scanning lines, each of said specified number of storage locations having a storage capacity corresponding to said specified number of main scanning lines of said display surface of said raster scan-type display unit, said data memory including

a data input memory, operatively connected to receive said data to be displayed and having a specified storage capacity, for storing said data to be displayed;

a display memory, operatively connected to said data input memory and to said first comparator and having a specified storage capacity, for receiving the data stored in said input data memory;

transferring means, operatively connected to said data input memory and to said display memory, for transferring the contents of said data input memory to said display memory, wherein said specified storage capacity of said data input memory and said specified storage capacity of said display memory are equal;

read out means, operatively connected to said data memory, for repeatedly reading said data memory in synchronism with the scanning of said main scanning lines of said raster scan-type display unit;

scanning line number generating means, operatively connected to said read out means, for generating the number of the main scanning line in synchronism with the scan-

ning of said raster scan-type display unit and for providing, as an output, the scanning line number corresponding to the number of the main scanning line being scanned;

a first comparator having first and second data inputs operatively connected to said data memory and to said output of said scanning line number generating means, respectively, having a first data output active when said first and second data inputs coincide, and having a second data output active when said first and second data inputs of said first comparator are in a state of non-coincidence;

delay means, having first and second inputs operatively connected to said data memory and to said read out means, respectively, for delaying the data read out of said data memory for a predetermined time corresponding to the time between two successive read outs of said data memory by said read out means;

a second comparator, having first and second data inputs operatively connected to said delay means and to said output of said scanning line number generating means, respectively, and having an output, for comparing said output of said delay means with said output of said scanning line number generating means, said output of said second comparator being active when said first data input of said second comparator is larger than said second data input of said second comparator;

first gate means, having a first input operatively connected to said output of said second comparator and having an output, for gating said output of said second comparator;

a third comparator having first and second inputs operatively connected to said second output of said first comparator and said output of said first gate means, respectively, for comparing said second output of said first comparator with said output of said first gate means and for providing an active output when said first and second inputs of said third comparator are in a predetermined state; and

first operating means, operatively connected to said first gate means and having first and second operating states, for controlling said gate means, said output of said second comparator disconnected from or operatively connected to said second input of said third comparator in dependence upon said first and second operating states, respectively;

first signal combining means, having a plurality of inputs operatively connected to said first output of said first comparator and to said output of said third comparator, respectively, and having a output with a mean period, operatively connected to said video signal input of said raster scan-type display unit, for combining said first output of said first comparator and said output of said third comparator.

4,464,657

MODULAR WAVEFORM GENERATOR FOR PLASMA DISPLAY PANELS

Michael J. Marentic, Orange, and Daniel A. Manseau, Garden Grove, both of Calif., assignors to Interstate Electronics Corp., Anaheim, Calif.

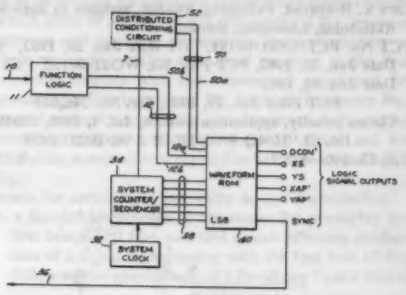
Filed Jun. 12, 1981, Ser. No. 273,092
Int. Cl.³ G09G 3/28
U.S. Cl. 340—776 **33 Claims**

1. An AC plasma panel system, comprising:

a plasma panel driver circuit; and

means for providing input waveforms for said driver circuit, said means comprising:

means for providing waveforms of different arbitrary lengths, each of said waveforms of different arbitrary lengths for accomplishing a different function on said



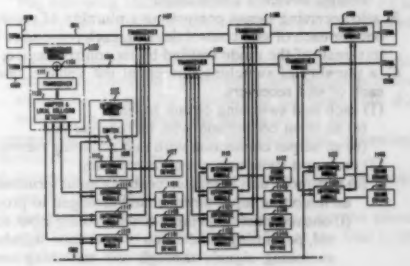
panel, wherein one of said functions is a write function and another of said functions is a sustain function.

4,464,658

MULTIPOINT DATA COMMUNICATION SYSTEM WITH COLLISION DETECTION

William Thelen, Glen Ellyn, Ill., assignor to AT&T Laboratories, Murray Hill, N.J.

Filed Mar. 5, 1982, Ser. No. 355,259
Int. Cl.³ H04Q 9/00; H04J 3/14
U.S. Cl. 340—825.5 **47 Claims**



1. An improved data communication system comprising:

a plurality of substantially duplicative communication media;

a plurality of transceiver means connected to the plurality of communication media, each transceiver means connected to at least one of the plurality of communication media for communicating across the at least one of the plurality of communication media;

collision detection means associated with each transceiver means for detecting collisions between a plurality of communications at least one of which involves the associated transceiver means; and

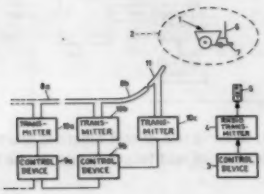
a plurality of means for interfacing using means and transceiver means for communication, each interface means connected to at least one of the plurality of transceiver means such that the using means have selective communication access via the at least one transceiver means to the plurality of communication media.

4,464,659

METHOD AND AN APPARATUS FOR REMOTE CONTROL OF A VEHICLE OR A MOBILE ENGINE

Lars K. Bergqvist, Falköping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

PCT No. PCT/SE81/00191, 371 Date Jan. 28, 1982, 102(e) Date Jan. 28, 1982, PCT Pub. No. WO82/00122, PCT Pub. Date Jan. 21, 1982
PCT Filed Jun. 29, 1981, Ser. No. 346,046
Claims priority, application Sweden, Jul. 1, 1980, 8004842
Int. Cl.³ H04Q *9/00*; H04B *1/00*; B62D *1/28*
U.S. Cl. 340—825.7 6 Claims



1. Apparatus for controlling operations of a vehicle from a selected one of a plurality of control devices, at least one of which is remote from the vehicle and each of which is arranged to emit any selected one of a plurality of different operation signals, each commanding performance of a particular operation, said apparatus comprising, at the vehicle, receiving means for receiving signals emitted from said control devices and actuating means for performing operations commanded by received operation signals, said apparatus being characterized by:

A. each of said control devices being further arranged

(1) to emit its signals in a mode unique to it and

(2) to selectably emit a switching signal distinctive to and designating each of the other control devices and whereby conversion to control by the designated other control device is commanded;

B. said receiving means comprising a plurality of receivers, one for each of said control devices, each responsive only to signals of the mode emitted by its control device; and

C. a plurality of switching circuits at the vehicle, one for each of said receivers,

(1) each said switching circuit having

(a) an input connection with its receiver and

(b) an output connection with said actuating means, and

(2) each said switching circuit comprising

(a) a memory unit having an enabling input terminal and an inhibiting input terminal and arranged to produce

(i) one response to an input to its enabling input terminal, permitting conduction of operation signals and switching signals through the switching circuit from its receiver, and

(ii) another response to an input to its inhibiting input terminal, preventing such conduction,

(b) transfer command means having a transfer output terminal for each of the other switching circuits and responsive to a switching signal from the receiver for its switching circuit to issue a transfer output to its transfer output terminal for the one of said other switching circuits that is designated by the switching signal, and

(c) switching control means comprising an AND-gate having a pair of control input terminals and a control output terminal and which produces an output at said output terminal in response to inputs at both of said control input terminals;

(i) one of said control input terminals being connected with the transfer output terminals of each of said other switching circuits, to receive transfer outputs therefrom as inputs,

(ii) the other of said control input terminals being connected with the receiver for its switching circuit to receive inputs therefrom in response to signals received by that receiver, and

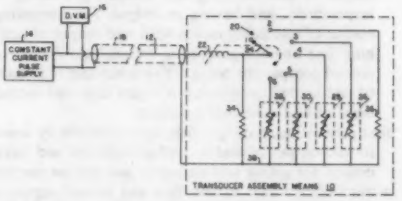
(iii) said control output terminal being connected with the enabling input terminal of the memory unit of its switching circuit and the inhibiting input terminal of the memory unit for each of the other switching circuits.

4,464,660

MULTICHANNEL REMOTE TRANSDUCER MONITORING SYSTEM

Warren G. Ginn, Pasadena, Calif., assignor to S-Cubed, La Jolla, Calif.

Continuation-in-part of Ser. No. 100,938, Dec. 6, 1979, Pat. No. 4,322,728. This application Jul. 29, 1981, Ser. No. 287,927
Int. Cl.³ G08C *19/04*, *19/32*
U.S. Cl. 340—870.38 9 Claims



1. An apparatus for monitoring physical phenomena at a remote location comprising:

a single conductor cable means having a near and a remote end;

means for periodically impressing a current pulse of fixed magnitude on said cable means at its near end thereof;

a transducer assembly means connected to the remote end of said cable means and including one or more transducer elements, each element varying in resistance as a function of the change in the physical phenomena being monitored by said element, and temperature insensitive passive means for selectively accessing each said transducer element, whereby said transducer assembly means is capable of operation at temperatures substantially in excess of 200° C., comprising:

(i) a stepper switch having a plurality of contacts and a swinger arm moveable along said contacts in a predetermined sequence, each said transducer element coupled to a respective one of said contacts;

(ii) means for coupling said current pulse from said cable means to said swinger arm;

(iii) means responsive to the termination of each said current pulse for moving the swinger arm of said stepper switch to the next contact in said sequence; and

means at the near end of said cable means for measuring the voltage generated by said current pulse.

4,464,661

SYSTEM MONITOR CIRCUIT HAVING FIRST AND SECOND PHASE-SENSITIVE DEMODULATOR CIRCUITS COUPLED TO FIRST AND SECOND LOADS, AND A COMPARATOR SECTION FOR MONITORING THE LOADS

William G. Redmond, Dallas, Tex., assignor to The LTV Aerospace and Defense Company, Dallas, Tex.

Filed Feb. 18, 1982, Ser. No. 349,791
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—960 18 Claims

10. A monitor circuit comprising:

(a) first and second phase-sensitive full-wave demodulator circuits, each circuit including:

(i) an operational amplifier means having a positive input terminal, a negative input terminal and an output terminal;

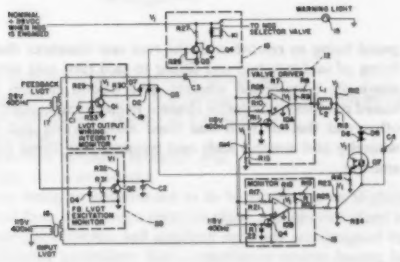
(ii) first and second series connected resistive means coupling said output terminal to said negative input terminal;

(iii) third resistive means coupling the node between said first and second resistive means to a predetermined voltage level;

(iv) fourth and fifth resistive means respectively coupling an AC input signal to the positive and negative terminals of said operational amplifier means;

(v) a field effect transistor having source, drain and gate terminals, said drain terminal being coupled to the positive terminal of said operational amplifier means, said source terminal being coupled to said predetermined voltage level; and

(vi) sixth resistive means for coupling an AC reference voltage to the gate terminal of said field effect transistor, the reference voltage being of the same frequency



as the AC input signal, the input signal being in phase with the reference voltage for error signals in a first direction and in opposite phase with the reference voltage for error signals in a second direction, wherein a demodulated output signal of amplitude proportional to the amplitude of said AC input signal is generated at said output terminal, the amplitude of said output signal being negative for an input signal which is of the same phase as said reference voltage and positive for an input signal which is of the opposite phase as said reference voltage;

(b) an actual load coupled to and driven by the output of said first demodulator circuit;

(c) a dummy load having essentially the same resistivity as said actual load coupled to the output of said second demodulator circuit;

(d) current comparator means coupled to said actual load and to said dummy load for generating a control signal when the difference between the currents flowing through the loads reaches a predetermined threshold value.

4,464,662

DETERMINING AZIMUTH OF A TRANSPONDER BY MEASURING A PLURALITY OF PHASE SHIFTS

Jean-Pierre Tomasi, Velizy, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 22, 1981, Ser. No. 256,744

Claims priority, application France, Apr. 25, 1980, 80 09412

Int. Cl.³ G01S *3/46, 13/78*

U.S. Cl. 343—16 R **8 Claims**

3. An apparatus for measuring the azimuth of a radio wave transponder relative to a radar system, comprising:

a. transmitting means for transmitting from the radar system to the transponder a signal having a frequency which varies linearly with time;

b. means for returning from the transponder a signal representative of the transmitted signal;

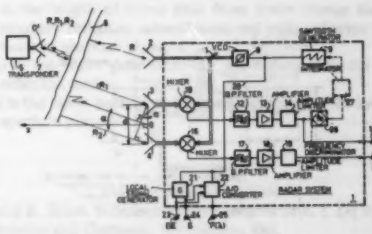
c. first and second receiving antennas located at a distance d from each other for receiving the returned signal at times which differ in relation to any differences in the distances between said receiving antennas and the transponder;

d. first means for mixing the signal received at the first receiving antenna with the transmitted signal and for producing a first beat signal Fb_1 having a frequency fb_1;

e. second means for mixing the signal received at the second receiving antenna with the transmitted signal and for producing a second beat signal Fb_2 having a frequency of fb_2;

f. means for measuring phase shifts ϕ_0 and ϕ'_0 including:

1. a first circuit coupled to the means for producing the first beat signal Fb_1, said first circuit effecting production of a signal B_1 beginning with the first beat of Fb_1 following the transmission of a frequency F_1 at a time t_1



and ending upon completion of a predetermined number of beats of Fb_1;

2. a second circuit coupled to the means for producing the second beat signal Fb_2, said second circuit effecting production of a signal B_2 beginning with the first beat of Fb_2 following the transmission of the frequency F_1 at time t_1 and ending upon completion of a predetermined number of beats of Fb_2;

3. means coupled to the first and second circuits for detecting the phase shift ϕ_0 between the beginnings of the signals B_1, B_2 and for determining the phase shift ϕ'_0 between the endings of the signals B_1, B_2; and

g. computing means coupled to the phase shift measuring means and adapted for:

3. determining an overall phase variation $\Delta\phi$ by performing the calculation $\Delta\phi = \phi'_0 - \phi_0$;

2. determining an approximate value $\phi_{\Delta\phi}$ for the phase shift between the signals Fb_1 and Fb_2 at the time t_1 by performing the calculation

$$\psi_{\Delta\phi} = \frac{F_1}{F_2 - F_1}\,\Delta\psi$$

3. determining the value of a constant k to the nearest integer by performing the appropriate one of the following calculations:

if the sign of $\Delta\phi$ is positive,

$$k = \frac{\psi_{\Delta\phi} - \psi_0}{2\pi}$$

if the sign of $\Delta\phi$ is negative,

$$k = \frac{\psi_0 - \psi_{\Delta\phi}}{2\pi}$$

4. determining the accurate value of the phase shift ϕ

between the signals Fb_1 and Fb_2 by performing the appropriate one of the following calculations:
if the sign of $\Delta\phi$ is positive, $\phi=\phi_0+2k\pi$
if the sign of $\Delta\phi$ is negative, $\phi=\phi_0-2k\pi$

5. determining the azimuth α of the transponder by performing the calculation

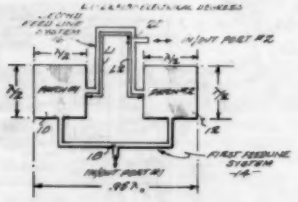
$$\alpha = \sin^{-1}\frac{c}{2\pi F_1 d}\phi.$$

4,464,663

DUAL POLARIZED, HIGH EFFICIENCY MICROSTRIP ANTENNA

Farzin Lalezari, and Robert E. Munson, both of Boulder, Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Nov. 19, 1981, Ser. No. 322,930
Int. Cl.³ H01Q *1/38, 9/38*
U.S. Cl. 343—700 MS **22 Claims**



1. A dual polarized single operating frequency microstrip antenna of the type having integral microstrip feedline and resonant radiating patches in an electrically conducting layer spaced by dielectric less than one-fourth wavelength above an underlying ground plane, said antenna comprising:

a pair of spaced apart radiating patches having substantially equal resonant dimensions of approximately one-half wavelength at the intended single operating frequency and defining a common space therebetween;

a first feedline system connected to each of said pair of radiating patches outside said common space for transmitting/receiving r.f. signals to/from a first feedpoint having a first polarization at said single operating frequency; and

a second feedline system connected back-to-back to each of said pair of radiating patches in the space therebetween for transmitting/receiving r.f. signals to/from a second feed point having a secodd polarization at said single operating frequency, said second polarization being different from said first polarization.

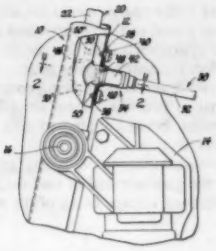
4,464,664

RADIO ANTENNA AND CONNECTOR APPARATUS

Ralph W. Edwards, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 4, 1982, Ser. No. 405,179
Int. Cl.³ H01Q *1/32, 1/10*
U.S. Cl. 343—715 **2 Claims**

1. In an automotive radio antenna of the type including an outer tube, a mast antenna disposed within said tube including an interior portion mounted in fixed relation therewith in directions radially thereof, connector apparatus comprising, means defining one or more apertures in the wall of said tube, a conductor cable assembly including a terminal end fitting adapted to be affixed to said tube over an aperture therein and having an annular abutment surface adapted when so affixed to be located a predetermined distance from said fixed mast portion and further having an interior electrical connector element, an elongated second electrical connector element movable with respect to said fixed mast portion and axially projecting through said aperture and telescopically received at one end thereof in electrical contact upon said interior element, means defining upon said second element a predetermined distance from the other end thereof a shoulder facing said abutment surface, and an elastomeric annulus received over the shank of said second element and interposed between the shoulder of the latter and said abutment surface of the terminal end fitting, the uncompressed length of said annulus so interposed being so related with the two said distances that upon fixing of said terminal end fitting to said tube said annulus is elastically compressed whereby said second element is held biased relative said interior element in electrical contact at said other end thereof with said fixed mast portion and further whereby said annulus seals said terminal end fitting from the ambient.

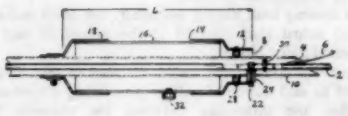


4,464,665

SLOTTED CABLE ANTENNA STRUCTURE

Chester B. Watts, Jr., 6505 Pinecrest Ct., Annandale, Va. 22003

Filed Feb. 12, 1982, Ser. No. 348,240
Int. Cl.³ H01Q *13/10*
U.S. Cl. 343—769 **3 Claims**

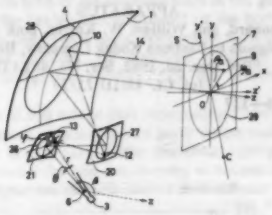


1. A slotted cable antenna structure comprising a coaxial transmission line having an inner conductor and an outer conductor, a slot formed between the outer surface of said outer conductor and a shunt conductor coaxially surrounding a portion of said outer conductor, said shunt conductor being connected at one end to said outer conductor, a probe screw at the opposite end of said shunt conductor, said probe screw conductively connected to said shunt conductor, said probe screw projecting through said outer conductor without conductive connection, said probe screw capacitively coupled to said inner conductor, and finally, a strand of insulating material having a negative temperature coefficient of dielectric constant, said strand running the length of said transmission line in the space between the inner and outer conductors, said strand being sized to compensate wholly or partially for the positive thermal expansion coefficient of said transmission line.

4,464,666
MULTIPLE REFLECTOR ANTENNA

Fumio Watanabe, and Yoshihiko Mizuguchi, both of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1982, Ser. No. 366,030
Claims priority, application Japan, Apr. 27, 1981, 56-062522
Int. Cl.³ H01Q 19/12
U.S. Cl. 343—781 P 4 Claims



1. A multiple reflector antenna comprising:
a main reflector formed of a portion of rotatively symmetrical surface with respect to a rotation axis,
a sub-reflector,
at least one auxiliary reflector, and
at least one wave source;
said axis being so constructed as to be parallel to or slightly deviated from the antenna aperture plane, and characterized in that said sub-reflector and auxiliary reflector are designed by the following procedure: first a coordinate system having its origin on the aperture surface is defined, and next a vector S representing a path from said origin to a point on said sub-reflector and a vector B representing a path from said origin to a point on said auxiliary reflector are defined, said vectors B and S being given by equations (1) and (2) below, function $f(\theta, \phi)$ included in said equations (1) and (2) is substantially determined by the solution of extremal value problem of a functional which is related to a function $f(\theta, \phi)$ representing a difference between a desired value and the actual value of the aperture field distribution at said antenna aperture plane,

$$\vec{B} = \vec{F_O} + f(\theta,\phi) \begin{vmatrix} \sin\theta\cos\phi \\ \sin\theta\sin\phi\cos\beta + \cos\theta\sin\beta \\ -\sin\theta\sin\phi\sin\beta + \cos\theta\cos\beta \end{vmatrix} \quad (1)$$

$$S = B + [l_O - \lambda_A - \lambda_M - f(\theta,\phi)]R_B \quad (2)$$

where

$$\vec{R_B} = \vec{I_B} - 2(n_B \cdot \vec{I_B})n_B$$

$$\vec{I_B} = \frac{\vec{B} - \vec{F_O}}{f(\theta,\phi)}$$

$$\vec{n_B} = \frac{1}{\sqrt{\left(\frac{\partial f(\theta,\phi)}{\partial\theta}\right)^2 + \left(\frac{1}{\sin\theta}\cdot\frac{\partial f(\theta,\phi)}{\partial\phi}\right)^2 + f^2(\theta,\phi)}} \times$$

$$\begin{vmatrix} -\cos\theta\cos\phi & \sin\phi & \sin\theta\cos\phi \\ -\cos\theta\sin\phi\cos\beta + \sin\theta\sin\beta & -\cos\phi\cos\beta & \sin\theta\sin\phi\cos\beta + \cos\theta\sin\beta \\ \cos\theta\sin\phi\sin\beta + \sin\theta\cos\beta & \cos\phi\sin\beta & -\sin\theta\sin\phi\sin\beta + \cos\theta\cos\beta \end{vmatrix} \cdot$$

-continued

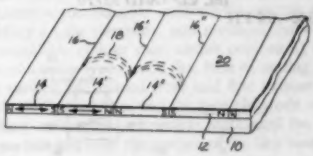
$$\begin{vmatrix} \frac{\partial f(\theta,\phi)}{\partial\theta} \\ \frac{1}{\sin\theta}\cdot\frac{\partial f(\theta,\phi)}{\partial\phi} \\ f(\theta,\phi) \end{vmatrix}$$

where,
FO is a vector of a path from the origin to the focus of the feed horn,
θ and ϕ are, respectively, zenith angle and azimuth angle in a polar coordinates with its center at the focus of the feed horn and zenith direction toward the center of the auxiliary reflector,
β is an angle between the zenith axis of said polar coordinates and the wave path from said main reflector to the aperture plane,
l_o is the length of wave path from wave source through auxiliary reflector, sub-reflector and main reflector to the antenna aperture plane,
λ_M is the wave path from the sub-reflector to the main reflector, and
λ_A is the wave path from the main reflector to the antenna aperture plane.

4,464,667
IMAGE RESOLUTION

Charles B. Jones, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 15, 1982, Ser. No. 398,309
Int. Cl.³ G01D 15/12
U.S. Cl. 346—74.2 5 Claims



1. A process for obtaining improved resolution of a magnetic toner image applied from a toned recording member containing a pattern of parallel magnetic lines in its image areas by contact transfer of the toner image from the recording member to a substrate surface wherein the improvement comprises removing excess toner from the toned recording member prior to toner image transfer to the substrate surface by an air flow passing across the surface of the recording member whereby the direction of air flow is substantially parallel to the magnetic line pattern in the recording member.

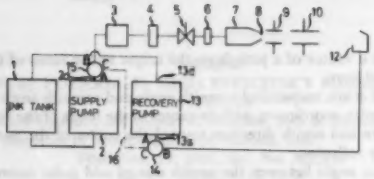
4,464,668
INK SUPPLY SYSTEM OF INK JET RECORDING APPARATUS

Hiromichi Komai, and Minoru Ameyama, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Japan

Filed Dec. 20, 1982, Ser. No. 462,420
Claims priority, application Japan, Dec. 22, 1981, 56-206029; Dec. 23, 1981, 56-207195; Dec. 23, 1981, 56-207196
Int. Cl.³ G01D 15/18
U.S. Cl. 346—75 4 Claims

1. An ink supply system of an ink jet recording apparatus of the electric charge control type comprising a supply pump for feeding ink under pressure to a recording head, an accumulator for equalizing the pressure of the ink, and valve means for

controlling the feeding of the ink under pressure to the recording head, said supply pump, said accumulator and said valve means being located in a piping for supplying the ink in an ink tank to the recording head in the indicated order as seen from the ink tank side, and a delivery pump located in a piping for returning ink to the ink tank from a catcher for recovering the ink ejected through the recording head but not contributing to



recording of information with ink drops, characterized by comprising conduits and change-over valves mounted between said ink tank, said supply pump and said deliver pump in such a manner that the ink supply system can be switched between a condition in which the ink in the ink tank can be fed under pressure to the recording head by the supply pump and a condition in which the ink in the ink tank can be filled in the supply pump through the recovery pump.

4,464,669

THERMAL PRINTER

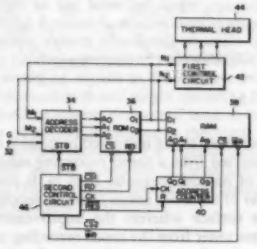
Kunihiko Sekiya; Mamoru Mizuguchi, both of Yokohama, and Takashi Ohzeki, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasakioshi, Japan

Filed Jun. 16, 1982, Ser. No. 388,976

Claims priority, application Japan, Jun. 19, 1981, 56-94639; Jun. 19, 1981, 56-94640

Int. Cl.³ G01D *15/10*

U.S. Cl. 346—76 PH **12 Claims**



3. A thermal printer for printing information on heat-sensitive paper during a plurality of printing cycles, said thermal printer comprising:

a plurality of heating elements;

power supply means for supplying said heating elements with electrical power;

control means connected between said heating elements and said power supply means for controlling the amount of electrical power supplied to each one of said heating elements in accordance with an energy code for each heating element;

energy code means connected to said control means for generating an energy code for each heating element in response to (a) the incoming information signal for said heating element, (b) the previous energy code for said heating element generated by said energy code means during the previous printing cycle, and (c) the previous adjacent energy codes for heating elements adjacent to said heating element generated by said energy code means during the previous printing cycle; and

memory means connected to said energy code means for storing the energy codes generated by said energy code means, said memory means supplying the energy codes to said energy code means during the next printing cycle as the previous energy codes.

4,464,670

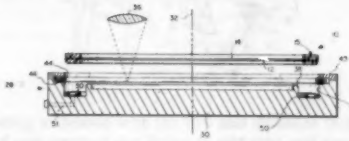
OPTICAL DISK MOUNTING MEANS FOR WRITE/READ APPARATUS

Eric M. Leonard, and William W. Knight, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 20, 1982, Ser. No. 451,127

Int. Cl.³ G01D *15/24*

U.S. Cl. 346—137 **15 Claims**



1. Disk write and/or read apparatus adapted for receiving a disk assembly which includes (1) a flexible, disk-shaped support carrying a record layer and (2) an annular retaining ring engaging the support around its peripheral region and positionable in a predetermined active position; said apparatus comprising:

(a) an annular locating surface rotatable about a predetermined axis, said locating surface engaging the support of a received disk assembly with a predetermined abutting force to provide firm contact between the disk-shaped support and said locating surface when the retaining ring is in the active position; and

(b) detent means for releasably securing the retaining ring in the active position, said detent means being releasable when subjected to a predetermined force from the retaining ring, whereby the retaining ring is movable out of the active position by mere application of sufficient force thereto.

4,464,671

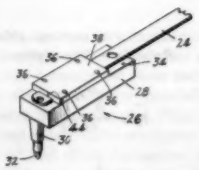
UNIVERSAL SLIP-ON MOUNTING FOR DISPOSABLE CHART PENS

William F. Lytle, Knight La., Orange, Conn. 06477

Filed Jun. 4, 1982, Ser. No. 385,239

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 A **16 Claims**



1. A universal slip-on pen cartridge device for attachment to the movable pen arm of chart recorders, comprising in combination:

(a) a molded plastic pen body part containing an ink reservoir and a stylus carried thereby, which latter is adapted for engagement with the paper chart of the recorder,

(b) said body part having a hollow neck on which the stylus is carried, and having a supporting surface against which

a corresponding flat part of the pen arm of the recorder can bear,

(c) a bridge part fabricated as a piece separate from said body part, said bridge part being disposed with a side thereof located opposite to the supporting surface of the body part,

(d) one of said parts having elongate guide means in that surface which faces the other part, thereby to provide a tunnel into which the pen arm can be inserted,

(e) portions of said body part and bridge part being fused together on both of the opposite sides of the guide means, to retain the bridge part positioned on the body part, and

(f) means on one of said parts, cooperable with the pen arm of a chart recorder, for yieldably retaining the fused-together bridge and body parts on said arm in operative position,

(g) portions of said bridge part constituting a continuous and uninterrupted span across said guide means such that body part and bridge part, when assembled, completely and fully surround the pen arm thereby to accurately position the body part on the pen arm of the recorder.

4,464,672

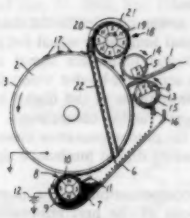
ELECTROGRAPHIC RECORDING APPARATUS

Richard W. Lindahl, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 15, 1982, Ser. No. 388,584

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—153.1 **8 Claims**



1. An improved electrographic apparatus for use with magnetically attractable, electronically conductive toner powder, the electrographic apparatus including: first and second electrodes in spaced opposing relationship; a receptor recording member spaced from the first electrode for providing a recording region between the first electrode and the receptor recording member, the receptor recording member adapted for making electronic contact with the second electrode and for movement past said first electrode; a hopper for holding a supply of toner powder from which a regular or relatively uniform supply of toner is provided to the recording region; a magnet disposed adjacent one side of the first electrode establishing a magnetic field at the first electrode to attract toner powder toward said first electrode, the magnet also attracting toner powder presented adjacent the recording region; the improvement including:

a first sleeve member of non-magnetic material disposed about the magnet and adapted for rotation to carry toner powder attracted toward the magnet away from said recording region;

a toner powder removal means including a second sleeve member of non-magnetic material and a magnetic field producing means disposed within said second sleeve member and adapted for rotation, said second sleeve member positioned close to the receptor recording member and close to said first sleeve member to cause said magnetic field producing means to attract toner powder that is loosely carried by said receptor recording member to said second sleeve member and attract toner powder carried by said first sleeve member to said second sleeve member and move such toner attracted to said second sleeve over the surface of said second sleeve member.

4,464,673

SEMICONDUCTOR COMPONENT

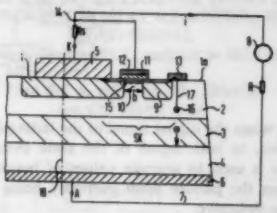
Hubert Patalong, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 9, 1981, Ser. No. 252,338

Claims priority, application Fed. Rep. of Germany, May 14, 1980, 3018499

Int. Cl.³ H01L *29/74, 29/747*

U.S. Cl. 357—38 **8 Claims**



1. In a semiconductor circuit arrangement of the type in which a semiconductor component includes a semiconductor body which comprises a first base of a first conductivity type on a second base of a second conductivity type, a first emitter of the second conductivity type in the first base and having a surface coplanar with the boundary surface of the semiconductor body, a second emitter on the second base on the side opposite the first base, a first electrode on the first emitter and a second electrode on the second emitter for connection across an external circuit including a voltage source, and at least one metal-insulator-semiconductor controllable emitter short circuit including a gate electrode, said metal-insulator-semiconductor controllable emitter short circuit comprising a zone of second conductivity type in said first base extending up to the boundary surface and spaced from said first emitter, an edge portion of said first emitter, and the gate electrode carried on the boundary surface over respective sections of the zone and the edge portion and over the portion of the first base therebetween, the improvement therein comprising:

a resistor including a first terminal connected to the first electrode and a second terminal for connection to the external circuit so that said resistor is in series with the component and the voltage source; and

conductor means directly connecting said second terminal of said resistor to said gate electrode of said metal-insulator-semiconductor controllable emitter short circuit.

4,464,674

METHOD AND APPARATUS FOR CONCEALING ERRORS IN A DIGITAL TELEVISION SIGNAL

Axel Schulz, Bickenbach, and Werner Staude, Reinheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 9, 1982, Ser. No. 366,936

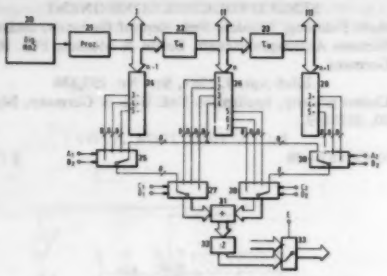
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1981, 3117206

Int. Cl.³ H04N *9/535*

U.S. Cl. 358—21 R **10 Claims**

1. Method of concealing defective picture points of television signals which includes making digital signals, separately for each of the three video components of color television signals, of picture points surrounding, so far as possibile, each picture point successively processed by the method, and substituting an average of values of nondefective picture points bracketing the picture point currently processed, by the use of

averaging circuit means, in the event the digital signal of the latter picture point is determined to be defective, said method incorporating, in accordance with the invention, the step of furnishing the picture point value of the picture point currently



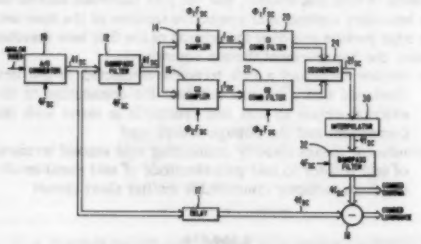
processed, when the digital signal of the latter picture point is nondefective, to both inputs of the same averaging circuit means that is used to average values of bracketing picture points when the picture point currently being processed is found to be defective.

4,464,675

LOW FREQUENCY DIGITAL COMB FILTER SYSTEM

Alvin R. Balaban, Lebanon, and Steven A. Steckler, Clark, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 4, 1982, Ser. No. 405,165
Int. Cl.³ H04N 9/535
U.S. Cl. 358—31 13 Claims



1. In a television signal processing system, including a source of sampled data video signals at a given data rate having first and second frequency interleaved signal components in a video passband, a comb filter system comprising:

a first bandpass filter having an input responsive to said sampled data video signals and an output at which filtered signal samples occupying a portion of said video passband are produced at said given data rate;

a comb filter, responsive to said filtered signal samples, and operating at a reduced data rate which is less than said given data rate, for producing a comb filtered signal at said reduced data rate; and

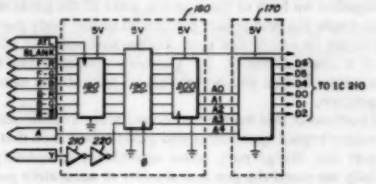
a second bandpass filter responsive to said comb filtered signal for producing a comb filtered signal at said given data rate which occupies a portion of said video passband.

4,464,676

DIGITAL COLOR MODULATOR

Gilbert E. Russell, Hayward, and Hee Wong, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 216,471, Dec. 15, 1980, abandoned. This application Aug. 3, 1982, Ser. No. 404,802
Int. Cl.³ H04N 9/535, 5/58
U.S. Cl. 358—37 1 Claim



1. A circuit for precompensating a digital luminance signal representing the amplitude of a serial dot-by-dot video luminance in response to the luminance amplitudes of preceeding dots, the circuit comprising:

clock means for providing periodic clock signals, one clock signal corresponding to a discrete dot;

delay means coupled to receive the clock signal and the digital luminance signal for providing a first signal corresponding to the digital luminance signal and delayed one clock period; and

precompensation means coupled to the delay means and to receive the digital luminance signal for providing a precompensated digital luminance signal representing the amplitude of a serial dot-by-dot video luminance in response to the amplitudes of thd digital luminance signal and the first signal, further comprising:

means coupled to the precompensation means for converting the precompensated digital luminance signal to a NTSC signal;

wherein the precompensation means increases the pulse width of portions of the precompensated digital luminance signal corresponding to bright dots in response to the digital luminance signal having a luminance amplitude greater than the amplitude of the first signal.

4,464,677

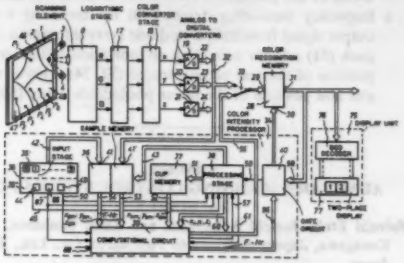
METHOD AND CIRCUIT ARRANGEMENT FOR PARTIAL RECORRECTION OF COLOR RECOGNITION SPACES IN COLOR RECOGNITION

Franz Kuhn, Schonkirchen, and Wilfried Lippek, Kiel, both of Fed. Rep. of Germany, assignors to Dr. -Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

PCT No. PCT/DE81/00027, 371 Date Sep. 9, 1981, 102(e) Date Sep. 9, 1981, PCT Pub. No. WO81/02205, PCT Pub. Date Aug. 6, 1981
PCT Filed Jan. 24, 1981, Ser. No. 302,475
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1980, 3003607
Int. Cl.³ H04N 1/46
U.S. Cl. 358—75 35 Claims

1. The method for partial correction of color recognition spaces in color recognition, in which identification symbols in the colors to be recognized are assigned to the color locations or, respectively, color component triads of trichromatically measured sample points and in which, for the formation of color recognition spaces around the sample color locations, identification symbols for the corresponding color locations are determined from the identification symbols of the sample color locations and in which color locations with the same identification symbol respectively form one color recognition space, comprising the steps of marking at least one additional

sample color location or its color component triad at a color recognition space in the spatial region of the subsequent boundary correction which if necessary has a different identification symbol allocated to it, cancelling the previous allocation



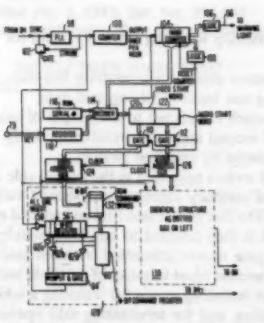
of identification symbols for the color locations lying around the auxiliary sample color location within a spatial cancel area, and filling each color location of the cancel area with a new identification symbol determined from the identification symbols of the sample color locations.

4,464,678

TIME WINDOW KEY SYSTEM FOR VIDEO SCRAMBLING

Leonard N. Schiff, Lawrenceville, and Smith Freeman, Skillman, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 21, 1982, Ser. No. 341,499
Int. Cl.³ H04N 7/16; H04K 1/04
U.S. Cl. 358—122 **4 Claims**



1. Apparatus for decoding a scrambled television signal in which scrambling is accomplished by distorting the television signal at a first rate in synchronism with a television synchronizing rate and in a manner determined by a sequential logic signal derived from a sequential logic circuit, the feedback connections of which are established by a command word and which first feedback connections control the sequence of said sequential logic generator, but which television signal, in order to prevent unauthorized keyless decoding, does not include at said first rate any signal representative of the state of said distortion; said apparatus comprising:

controllable distortion correction means adapted to receive said scrambled television signal;

code-controlled sequential logic signal generating means coupled to said controllable distortion correction means and including second combinational logic circuit means for generating a sequential control signal at said first rate corresponding with said sequential logic signal and having a sequence established by controllable feedback connections of said combinational logic circuit corresponding with said first feedback connections;

time-of-day clock signal generating means;

distinguishing serial-number memory means for storing a serial-number signal uniquely distinguishing said apparatus from other similar apparatus;

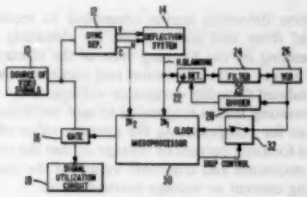
code signal decoding means coupled to said time-of-day clock signal generating means, to said serial-number memory means, to a key word source and to said code-controlled sequential logic means for generating said code word from said time-of-day clock signal, said serial-number signal and from said key word so that said code word is identical to said command word only if said key word and said time of day are related.

4,464,679

METHOD AND APPARATUS FOR OPERATING A MICROPROCESSOR IN SYNCHRONISM WITH A VIDEO SIGNAL

Robert A. Wargo, Ringoes, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,475
Int. Cl.³ H04N 5/04
U.S. Cl. 358—148 **18 Claims**



1. In a television receiver, including a source of video signals including synchronizing signal components, and a synchronizing signal separator circuit responsive to said video signals for producing separated horizontal line rate synchronizing signals, apparatus comprising:

a microprocessor having a clock input for receiving a clock signal, a data input coupled to receive said synchronizing signals, and an output at which a control signal is produced, said microprocessor being capable of executing a program of instructions, the execution of an instruction cycle taking a given number of clock signal cycles;

means having an input coupled to receive said synchronizing signals and an output for producing a clock signal which is substantially aligned in phase with said synchronizing signals;

means for coupling said output of said clock signal producing means to said clock input of said microprocessor, the frequency of said clock signal being chosen as an integer multiple of said horizontal line rate for enabling said microprocessor to execute an integer number of instruction cycles during a horizontal line interval to sample the state of said data input synchronously with said synchronizing signals; and

a signal utilization circuit coupled to said output of said microprocessor.

4,464,680

TELEVISION CAMERA HAVING AUTOMATIC FOCUSING DEVICE FOR ELECTRON BEAM OF PICKUP TUBE

Junichi Yamanaka, Sagamihara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 20, 1982, Ser. No. 380,255
Claims priority, application Japan, May 25, 1981, 56-78976
Int. Cl.³ H04N 3/26
U.S. Cl. 358—218 **7 Claims**

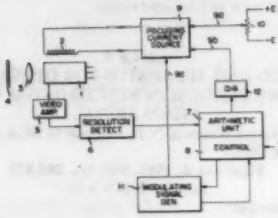
1. In a television camera having a device for automatically adjusting the focusing state of an electron beam on a target in

a pickup tube, said automatic focus adjusting device comprising:

focusing means responsive to focusing current or voltage for focusing the electron beam on said target;

supply means for supplying the focusing current or voltage to said focusing means;

said supply means being responsive to application of a modulating signal thereto to supply a modulated focusing current or voltage which varies between maximum and minimum values with its average value at the center;



resolution detecting means connected to receive a video signal from said pickup tube for detecting resolutions depending on the focusing state of the electron beam on said target at the maximum and minimum values of the modulated focusing current or voltage; and

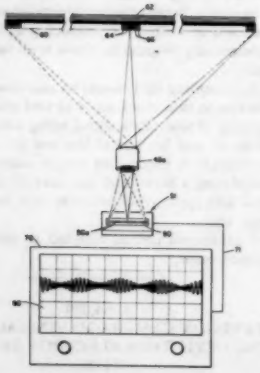
compensating means responsive to said resolution detecting means for compensating the average value of the modulated focusing current or voltage so that the resolutions at the maximum and minimum values of the modulated focusing current or voltage become equal.

4,464,681

METHOD AND APPARATUS FOR ADJUSTING A FACSIMILE DOCUMENT SCANNER

Norman A. Jacobs, Arlington Heights, and Jagdish T. Madhav, Morton Grove, both of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed Apr. 15, 1982, Ser. No. 368,619
Int. Cl.³ H04N *1/10*
U.S. Cl. 358—285 **8 Claims**



1. An apparatus for adjusting a facsimile document scanner (10) having an adjustable optical system (23) for focusing an image (72, 74) onto a linear photodiode array (50) mounted within an integrated circuit pack (51) comprising:

a test pattern (60) having a plurality of parallel alternating light reflecting and light absorbing stripes (64, 66), said light reflecting and light absorbing stripes (64, 66) being of equal width and sized so that the image (72, 74) of said test pattern through the optical system (23) will produce an image pattern on the linear photodiode array (50) with the light and dark areas of the image each being generally the width of the photocells (50) of the diode array, and

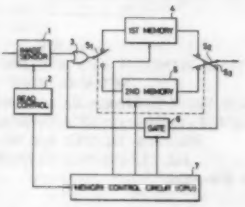
a frequency measuring device (70) for receiving a serial output signal from the photodiode array integrated circuit pack (51) and for providing an indication of the size and position of the test pattern image (72, 74) relative to the size and position of the linear photodiode array (50).

4,464,682

AUXILIARY SCANNING CONTROL SYSTEM FOR FACSIMILE

Satoshi Etoh; Junichi Kobayashi, and Kenji Tanimoto, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 13, 1982, Ser. No. 377,769
Int. Cl.³ H04N *1/17*
U.S. Cl. 358—288 **7 Claims**



1. An auxiliary scanning control system for facsimile, comprising:

image sensor means for outputting line data, and gate means having one input receiving said data;

a first switch connected to the output of said gate means;

first and second memory circuits selectively coupled to said gate means by said first switch;

a second switch provided at the output side of said first and second memory circuits, said second switch being connected to that one of said first and second memory circuits which is then coupled to said first switch; and

further gate means connected between said second switch and a second input terminal of said gate means, said system further including means for initiating a white line skipping operation, and for terminating said operation after black data is read during said operation, said black data read during said skipping operation being stored in one of said memory circuits, and means for adding said black data to data of the next line read.

4,464,683

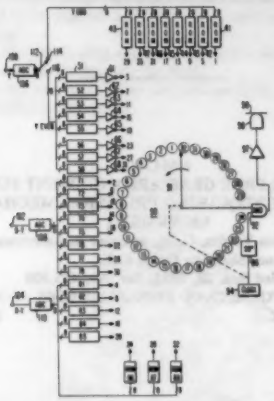
DIGITAL RECORDING OF TELEVISION COMPONENTS WITH IMPROVED TRANSITION SPACING

Charles R. Thompson, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 12, 1982, Ser. No. 338,861
Int. Cl.³ H04N *9/32, 5/76;* H03K *13/01*
U.S. Cl. 358—310 **16 Claims**

1. A method of transmitting a plurality of at least partially correlated digital words wherein some combinations of said plurality of words are physically unrealizable and some combinations of said plurality of words are physically realizable, said method comprising assigning code words to said digital words such that code words having digits substantially all of the same

selected level are avoided in the assignement of code words to physically realizable combinations of said digital words, and



transmitting said assigned code words in non-return-to-zero format.

4,464,684

VIDEO RECORDER PROVIDING TRANSIENT-FREE AUDIO SIGNALS

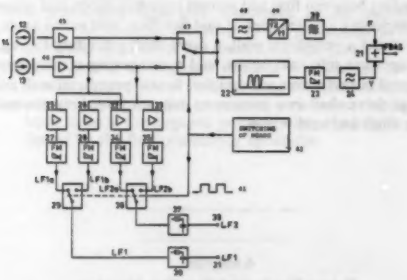
Hans-Jürgen Kluth, Garbsen, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 1, 1982, Ser. No. 394,144

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1981, 3125879

Int. Cl.³ H04N 9/491, 5/782

U.S. Cl. 358—310 **4 Claims**



1. A television tape recorder in which a television signal, composed of a picture carrier which is frequency modulated with a video signal and an audio carier frequency modulated with an LF audio signal, is recorded along successive oblique tracks of a record carrier such that one successive picture field is recorded along each track, said recorder including a playback portion comprising: transducer means composed of two playback heads for alternatingly scanning successive tracks on the record carrier such that successive segments of the modulated audio carrier are picked up by alternate ones of said heads; two separate FM demodulators each connected to a respective playback head for receiving the audio carrier segments picked up its respective heads and for demodulating those segments; means defining an audio signal path; and switching means connected between said demodulators and said path for selectively connecting each said demodulator to said path during the time when the playback head connected to that demodulator is scanning a track; whereby interference in the audio signal in said path is reduced.

4,464,685

METHOD AND APPARATUS FOR DECODING AND RECORDING COMPOSITE DIGITAL TELEVISION SIGNALS TO PREVENT DEGRADATION OF THE SIGNALS

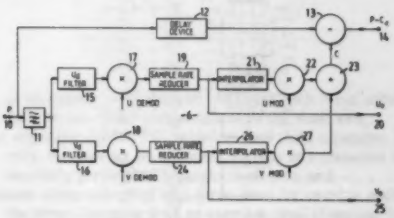
James H. Wilkinson, Tadley, near Basingstoke, England, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 226,824, Jan. 21, 1981. This application Sep. 30, 1983, Ser. No. 537,781

Claims priority, application United Kingdom, Jan. 30, 1980, 8003083

Int. Cl.³ H04N 9/191, 9/36

U.S. Cl. 358—310 **21 Claims**



1. A method of decoding, processing and subsequently recoding a composite digital color television signal having a luminance component and at least one chrominance component, comprising:

decoding said composite digital television signal by the steps of:

separating from said composite digital color television signal said at least one chrominance component which has been digitized by being sampled at a first sample rate;

reducing the sample rate of the separated chrominance component to provide a sample-reduced chrominance component forming a first decoder output signal;

interpolating samples into the sampe-reduced chrominance component in response to the sample-reduced chrominance component to provide an interpolated chrominance component having its sample rate restored to the original value of the first sample rate; and

subtracting the interpolated chrominance component from said composite digital television signal to form a second decoder output signal containing said luminance component and information as to errors in said samples interpolated into the sample-reduced chrominance component; processing said first and second decoder output signals; and

recoding said composite digital television signal from the processed first and second decoder output signals by the steps of:

interpolating samples into said processed first decoder output signal in a manner substantially identical to said first-mentioned step of interpolating and in response to said processed first decoder output signal to provide a second interpolated chrominance component having its sample rate restored to said original value; and

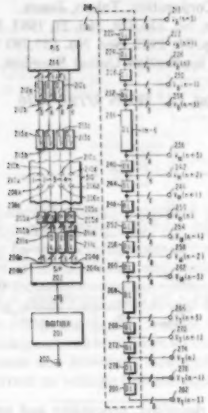
adding the second interpolated chrominance component obtained by the immediately preceding step to said processed second decoder output signal to provide a reformed composite digital color television signal in which errors due to interpolation are compensated.

4,464,686

ADAPTIVE TELEVISION SIGNAL ESTIMATOR

Glenn A. Reitmeier, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 170,811, Jul. 21, 1980, Pat. No. 4,376,955.
This application Oct. 20, 1982, Ser. No. 435,485
Claims priority, application United Kingdom, Feb. 28, 1980, 8006722
Int. Cl.³ H04N 9/535
U.S. Cl. 358—314 4 Claims



1. An adaptive television signal estimator for producing an estimate of the value of a pixel by processing surrounding information, comprising:

delay means for providing pixel amplitude signals from pixels preceding and following a currently processed pixel;

first averaging means coupled to said delay means for receiving therefrom pixel amplitude signals representing pixels from horizontal lines preceding and following the line containing said currently processed pixel for producing a first estimate of the value of said currently processed pixel by processing said pixels from horizontal lines preceding and following the line containing said currently processed pixel;

second averaging means coupled to said delay means for receiving therefrom pixel amplitude signals representing pixels preceding and following said currently processed pixel for producing a second estimate of the value of said currently processed pixel by processing said pixels preceding and following said currently processed pixel on said line containing said currently processed pixel;

absolute-value means coupled to said delay means for receiving therefrom said pixel amplitude signals from pixels preceding and following said currently processed pixel for producing first and second signals representative of the magnitude of the rate of change of the values of the pixels in first and second directions, respectively;

comparison means coupled to said absolute-value means for receiving said first and second signals therefrom for generating a control signal indicative of the one of said first and second signals having the least magnitude; and

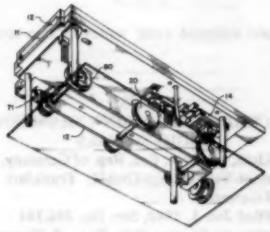
gating means coupled to said first and second averaging means for receiving said first and second estimates therefrom, respectively, and coupled to said comparison means for receiving said control signal therefrom for gating to an output terminal one of said first and second estimates under the control of said control signal.

4,464,687

JITTER-FREE GEAR ARRANGEMENT FOR EQUIPMENT REQUIRING PRECISION MECHANICAL MOVEMENT

Rene Baus, Palos Verdes, Calif., assignor to American Magnetics Corporation, Sherman Oaks, Calif.

Filed Sep. 28, 1982, Ser. No. 425,505
Int. Cl.³ G11B 25/04; F16H 57/12; G06K 13/103
U.S. Cl. 360—2 16 Claims



1. A drive assembly including a wheel having an aperture extending between first and second opposing faces, said wheel also including a recess open at said first face, said recess having a floor and a peripheral wall, a drive shaft extending through said aperture into said recess, and a dampening arrangement disposed in said recess and coupled to said peripheral wall and to said drive shaft in a manner to dampen jitter between said drive shaft and said wheel.

4,464,688

Patent Not Issued For This Number

4,464,689

RANDOM ACCESS READ/WRITE UNIT

Franklin M. Propst, Urbana, Ill., assignor to Education & Informations Systems, Inc., Champaign, Ill.

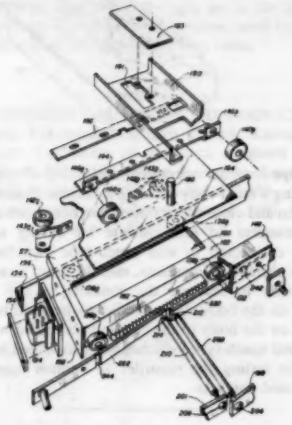
Filed Jun. 4, 1981, Ser. No. 270,419
Int. Cl.³ G11B 21/08, 15/48
U.S. Cl. 360—78 32 Claims

1. An apparatus for storing or retrieving information in or from a storage medium having a plurality of storage positions,

said apparatus including a read/write head movable along the plurality of storage positions for sensing the information or for placing the information in the storage medium and accessing means for causing the head to access a desired storage position identified by a desired position value, said accessing means comprising:

means for developing a current position value representing the current position of the head;

means for comparing the current position value with the desired position value;



means responsive to the comparing means for causing relative movement of the head and storage medium to decrease the distance between the head and the desired storage position;

first positioning apparatus responsive to the comparing means for causing the head to be positioned within a particular distance of the desired storage position;

a latch having an engaged position wherein the head is accurately positioned at the desired storage position; and

means responsive to the comparing means for causing the latch to be in the engaged position when the head is positioned by the first positioning apparatus.

4,464,690

HELICAL SCAN RECORDER WITH THREE-POINT HEAD MOUNTING

Lubomir Hanecka, and Heinrich Hütter, both of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 227,829, Jan. 23, 1981, abandoned. This application Feb. 10, 1983, Ser. No. 465,382

Claims priority, application Austria, Apr. 14, 1980, 2009/80; Feb. 13, 1983, 775/80

Int. Cl.³ G11B *5/08*

U.S. Cl. 360—84 **21 Claims**

1. A rotating head recorder for use with a magnetizable record carrier in the form of a tape, comprising

a rotatable shaft,

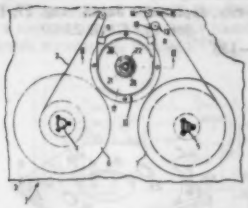
a support having a hub, force-coupled to said shaft, said hub comprising at least one axially projecting tubular portion coaxial with said shaft,

at least one magnetic head mounted on said support for rotation therewith for scanning a record carrier along information tracks, and

a releasable clamping device for engaging said hub portion and clamping it on the shaft so as to provide the force coupling between the support and the shaft,

characterized in that the clamping device comprises:

first, second and third clamping jaws force-coupled to each other and each having a clamping surface arranged to engage the tubular portion of the hub in a plane tangential thereto, said clamping surfaces engaging the tubular portion at locations spaced circumferentially about the shaft



at an angular separation of 120° from each other substantially in one plane perpendicular to the shaft axis,

an adjusting device for adjusting said third clamping jaw only, for moving its clamping surface in a direction substantially perpendicular to the shaft axis, and

means interconnecting said three jaws for causing each of the three clamping jaws to exert an equal clamping force on the tubular portion directed perpendicularly to a tangential plane in which the clamping surface of the respective clamping jaw engages the tubular portion, thereby obtaining force coupling between the support and the shaft.

4,464,691

MAGNETIC REPRODUCING SYSTEM

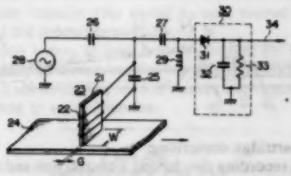
Norikazu Sawazaki, and Shu Chiba, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 5, 1981, Ser. No. 290,325

Claims priority, application Japan, Aug. 13, 1980, 55-110340

Int. Cl.³ G11B *5/34, 5/04*

U.S. Cl. 360—111 **9 Claims**



1. A magnetic reproducing system comprising:

a magnetic head having a magnetic body buried in a molding which serves as a head base, in such a way that it is partly exposed and is in frictional contact with a magnetic recording medium, and a strip coil buried in said molding in such a way that it is electromagnetically coupled with said magnetic body, and the edge of said strip coil on one side thereof is in the vicinity of said magnetic body; and

means for obtaining a reproduced signal across said strip coil according to changes in a record magnetic field of said magnetic recording medium, wherein said reproduced signal obtaining means has a tuned circuit including said strip coil, a pair of conductive film divisions provided on

said head base and connected to opposite ends of said strip coil, and a tuning capacitor connected between said pair of conductive film divisions, means for supplying a high frequency signal to the tuned circuit and means for deriving a signal corresponding to said record magnetic field through the detection of changes in the voltage of the high frequency signal supplied to said tuned circuit.

4,464,692

MAGNETIC SHEET CASSETTE DEVICE

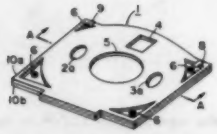
Shigeru Yoshida, Chichibu, and Yasuo Kawai, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1981, Ser. No. 292,594

Claims priority, application Japan, Aug. 27, 1980, 55-117001

Int. Cl.³ G11B *23/02*

U.S. Cl. 360—133 **9 Claims**



1. A sheet cassette device, comprising:

a disk shaped sheet having opposed recording faces thereon and an outer peripheral portion; and

a cassette casing for accommodating said sheet therein, said casing defining a chamber having a support portion and a cavity portion, the support portion being dimensioned to rotatably support said sheet at the peripheral portion thereof, the cavity portion being dimensioned to accommodate the recording faces of said sheet therein such that the recording faces are spaced from said casing.

4,464,693

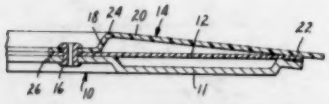
SNAP-ACTION CARTRIDGE FOR RECORDING DISC

Sten R. Gerfast, Mendota Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 19, 1982, Ser. No. 369,904

Int. Cl.³ G11B *23/02*

U.S. Cl. 360—133 **10 Claims**



1. A cartridge comprising:

a rigid recording disc having a central hub and a circular rim defining a periphery of said disc;

a circular cover concentrically fastened to said disc at said hub, said cover including a circular line of flexure adjacent said hub and an annular area radially outward from said line of flexure and being bistable and movable by snap-action between a first stable position of normal conical shape wherein said annular area is spaced from said disc adjacent said hub and contacts the entire periphery of said disc to protect the area of said disc between said hub and said rim and a second stable position of inverted conical shape wherein said annular area is increasingly spaced from said disc radially outward from said line of flexure toward said periphery to provide access to said disc.

4,464,694

TAPE RECORDER

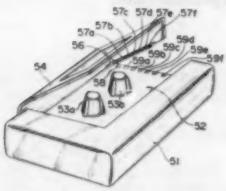
Makoto Kondo, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1981, Ser. No. 245,220

Claims priority, application Japan, Mar. 21, 1980, 55-37725; Mar. 21, 1980, 55-37726

Int. Cl.³ G11B *1/00*

U.S. Cl. 360—137 **13 Claims**



1. A tape recorder operable in a plurality of operating modes comprising a main body forming a cassette chamber, a cassette lid to open and close the cassette chamber, touch-type switches on the cassette lid said cassette lid having a plurality of contacts connected to said touch-type switches, said body having a plurality of contacts, said lid being arranged relative to the body to separate the contacts on the lid from the contacts on the body when the lid is open and to connect the contacts on the body to the contacts on the lid when the lid is closed, said touch-type switches being arranged when the lid is closed for setting the recorder to various operating modes through said contacts.

4,464,695

MAGNETIC TAPE CASSETTE APPARATUS HAVING AN OVER-TRAVEL PUSHBUTTON MOVEMENT

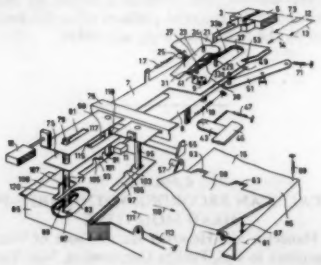
Klaus Kommoss, Wetzlar-Naunheim, and Valentin H. Schütte, Wetzlar, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,837

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1980, 3042746

Int. Cl.³ G11B *5/008, 15/00, 17/00*

U.S. Cl. 360—137 **13 Claims**



1. An interlocked control mechanism for controlling a plurality of apparatus functions, comprising at least two rods mounted for individual movement from an initial position over a given travel in an actuating direction for controlling respective individual apparatus functions, in response to individual movement of a rod; and means for individually latching a rod, which has been moved said given travel, in a position in which a respective apparatus function is performed,

characterized in that the mechanism further comprises

a respective latching projection arranged on each of said rods,

a latching slide movable between a latched position and a release position, and having respective latching cams arranged to engage a respective latching projection of a rod which is in the position in which the individual function is performed while the latching slide is in the latched position,

means, responsive to the simultaneous movement of said at least two words from the initial position over said given travel, for permitting movement of said two rods over a common overtravel path past the position in which the individual function is performed, and

an intermediate slide arranged to retain said latching slide in the release position while the rods are in the overtravel path moving toward the initial position, until the latching projections have passed the latching cams.

4,464,696

SECONDARY ARC EXTINCTION DEVICE

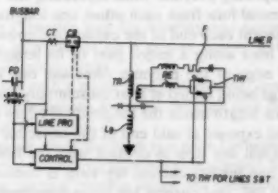
Michio Masui, Yokohama; Yasuhiro Ogawa, Kamagaya, and Kunio Esumi, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 19, 1982, Ser. No. 379,958

Claims priority, application Japan, May 19, 1981, 56-75174

Int. Cl.³ H02H *3/16*

U.S. Cl. 361—42 **7 Claims**



1. A secondary arc extinction device in an electric power system comprising:

a bus bar;

an electric power line connected to said bus bar;

protective relaying means connected to said bus bar;

a transformer having a primary winding and a secondary winding, one terminal of said primary winding being connected to said electric power line;

first reactance means connected between the other terminal of said primary winding of said transformer and ground;

second reactance means connected to said secondary winding of said transformer; and

means for controlling the reactance of said second reactance means in response to said protective relaying means to produce resonance to extinguish a secondary arc when the secondary arc occurs.

4,464,697

PROTECTIVE RELAY SYSTEM

Shan C. Sun, Coral Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 13, 1982, Ser. No. 397,758

Int. Cl.³ H02H *3/30*

U.S. Cl. 361—64 **16 Claims**

1. A protective relay system for providing pilot protection for an alternating current transmission line section having at least first and second terminals, comprising:

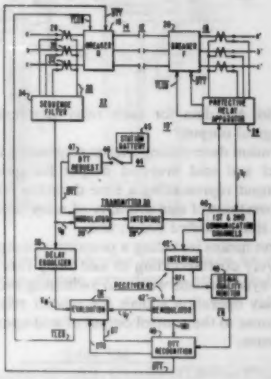
first and second circuit interrupting means at the first and second terminals, respectively, to be protectively controlled;

means at the first and second terminals for providing first and second protective relay signals, respectively;

communication means including first transmitter means, a first communication channel, and a first receiver, for communicating the first protective relay signal from the first to the second terminal, and second transmitter means, a second communication channel, and second receiver means for communicating the second protective relay signal from the second to the first terminal, wherein said first transmitter means includes means for providing a carrier signal, and wherein the first protective relay signal modulates said carrier signal to produce a modulated first protective relay signal for transmission from the first to the second terminal;

means at each terminal for comparing the modulated first protective relay signal and the second protective relay signal, and for providing a trip signal for the associated circuit interrupting means when the comparison indicates a fault in the protected line section;

direct transfer trip means at at least the first terminal for initiating a request signal for a direct transfer trip of the second circuit interrupting means;



signal means providing a direct transfer trip signal in response to said request signal from said direct transfer trip means, wherein said signal means includes means for deriving said direct transfer trip signal from said means for providing said carrier signal, such that said direct transfer trip signal is synchronized with said carrier signal;

means substituting said direct transfer trip signal for said first protective relay signal, wherein said direct transfer trip signal modulates said carrier signal to produce a modulated direct transfer trip signal for transmission from the first to the second terminal with said first transmitter means and first communication channel communicating said direct transfer trip signal to said second receiver means at the second terminal;

and detecting means at said second terminal for detecting said modulated direct transfer trip signal, and for providing a trip signal for the second circuit interrupting means in response to such detection.

4,464,698

PROTECTIVE RELAY

Atsuhiro Yoshizaki, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 20, 1982, Ser. No. 420,300

Int. Cl.³ H02H *3/38*

U.S. Cl. 361—79 **9 Claims**

1. A protective relay for performing a plurality of relay functions in response to received AC data, comprising:

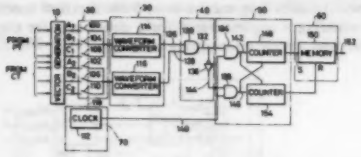
vector generating means responsive to received AC data for generating a plurality of vectors indicative of parameters of said AC data relating to the relay operations of said plurality of relay functions;

switching means responsive to said vector generating means for sequentially sampling said plurality of vectors for each of said relay functions in pairs in a specified order of said

relay functions to produce first and second sampled outputs;

level discriminating means connected to said switching means for comparing said first and second sampled outputs with respective slice levels selectively assigned to each relay function so as to produce first and second pulses having a given amplitude each time the respective first and second sampled outputs exceeds the respective slice level;

logic means for logically processing said first and second pulses produced by said level discriminating means to produce a logical output indicative of a characteristic of



said AC data for each relay function and an inverted logical output;

operation determining means responsive to said logical output and said inverted output for generating a control output representing a time duration relating to the relay operations of said plurality of relay functions sequentially in said specified order; and

output means including a plurality of output circuits respectively corresponding to said relay functions and selected in synchronism with said switching means for producing relay operation signals for related relay functions in response to the control output of said operation determining means.

4,464,699

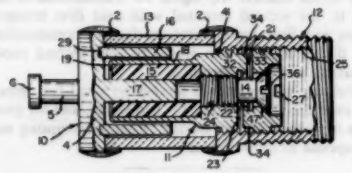
SHOCK PROOF ADJUSTABLE LOW-LOSS CAPACITOR

Arthur Bunce, Cedar Grove, N.J., and John E. Johanson, deceased, late of Boonton, N.J. (by Edna L. Johanson, executrix), assignors to Johanson Manufacturing Corporation, Boonton, N.J.

Filed Jun. 22, 1982, Ser. No. 390,804

Int. Cl.³ H01G 5/14

U.S. Cl. 361—296 **25 Claims**



7. An adjustable capacitor comprising

(a) a stator unit, having a first set of electrodes comprised of at least one electrode, and a rotor unit having a center axis and having a second set of electrodes comprised of at least one electrode, wherein each electrode of said second set is arranged substantially parallel to each electrode of said first set and is separated from each electrode in said first set and is adapted to move in a predetermined relationship with respect to a corresponding electrode of said first set to vary the capacitance value of said variable capacitor, and

(b) means inserted into said rotor unit for moving at least a first portion of said rotor unit in a longitudinal direction substantially parallel to said center axis with respect to a second portion of said rotor unit whereby the position of said second set of electrodes is frictionally locked relative to that of the first set.

4,464,700

POWER CAPACITOR

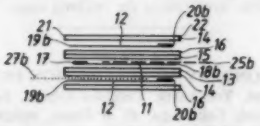
Bo Stenerhag, Upsala, and Lars E. Wirsen, Saltsjö-Duvnäs, both of Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Dec. 15, 1982, Ser. No. 449,877

Claims priority, application Sweden, Dec. 17, 1981, 8107577; Feb. 19, 1982, 8201030

Int. Cl.³ H01G 1/14, 4/06

U.S. Cl. 361—307 **16 Claims**



1. A capacitor element for a power capacitor comprising: first and second metal foils wound together, solid dielectric material comprising polymer films separating the wound first and second metal foils from each other, one longitudinal metal foil edge adjacent each end of the capacitor element and being unfolded at least along a major part of its length inside the longitudinal edge of the polymer films and one longitudinal metal foil edge being folded at least substantially longitudinally throughout its length inside the longitudinal edges of the polymer films and exposed at said end of the capacitor element, at least one current tap strip in contact with the first metal foil and at least one further current tap strip in contact with the second metal foil, said current tap strips constituting separate elements and protruding endwise from the capacitor element, each said tap strip, adjacent the end of the capacitor element from which it protrudes, being positioned between folded edge portions of adjacent wound layers of the metal foil which the tap strip does not contact, said folded edge portions being folded substantially in the longitudinal direction of the metal foil in question.

4,464,701

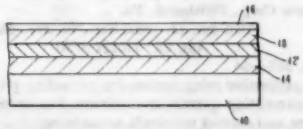
PROCESS FOR MAKING HIGH DIELECTRIC CONSTANT NITRIDE BASED MATERIALS AND DEVICES USING THE SAME

Stanley Roberts, South Burlington, and James G. Ryan, Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 29, 1983, Ser. No. 527,454

Int. Cl.³ H01G 4/10, 4/06

U.S. Cl. 361—313 **27 Claims**



25. A capacitor structure formed by a process comprising:

forming a mixture of a transition metal nitride and silicon nitride on a surface of a first conductive layer;

oxidizing said mixture to convert at least a portion of said transition metal nitride into an oxide of said transition metal;

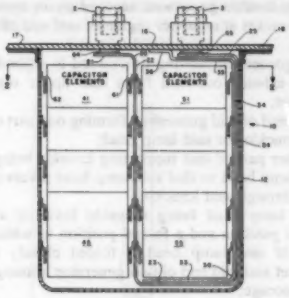
and forming a second conductive layer on said mixture.

4,464,702

EMI FILTER CAPACITOR UNIT

Gordon W. Miller, Vestal, and Larry L. McClintock, Apalachin, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 14, 1983, Ser. No. 504,183
Int. Cl.³ H01G *4/38*
U.S. Cl. 361—328 **5 Claims**



1. A filter capacitor unit for filtering and suppressing electromagnetic interference on a power supply line, said filter capacitor unit comprising:

a metal case with a metal top, first terminal means and second terminal means mounted through said metal top and insulated therefrom,

a feedthrough bus in the form of a wide U-shaped metal strip connected to the first terminal means inside the case, with a center portion passing down the center of the case, a bottom portion passing adjacent one-half of the bottom of the case, an outer portion passing up adjacent to one wall of the case, and connected to the second terminal means inside the case;

a ground bus in the form of a wide metal strip serving as an internal noise partition connected to the metal top and extending adjacent said outer and bottom portions of the feedthrough bus, so that the feedthrough bus is between the ground bus and the case;

a plurality of capacitor elements organized as two sets, with the capacitor elements of the first set connected between one side of the center portion of the feedthrough bus and one wall of the case, and the capacitor elements of the other set connected between the other side of the feedthrough bus and the ground bus.

4,464,703

METAL CLAD SWITCHGEAR HAVING EXTERIOR VENTILATION SHAFTS

Norman Davies, and Ronald E. Vaill, both of Irwin, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 12, 1982, Ser. No. 397,256
Int. Cl.³ H02B *1/04*
U.S. Cl. 361—342 **2 Claims**

1. A metal clad switchgear construction, comprising:

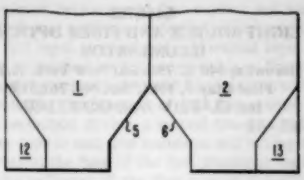
(a) a housing means for enclosing electrical apparatus;

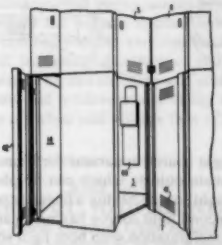
(b) a plurality of compartments within said housing means;

(c) a plurality of stationary contacts disposed within said plurality of compartments;

(d) a plurality of removable circuit breaker means mounted in the front of said housing means and having removable contacts for making electrical engagement with said stationary contacts;

(e) said housing means having a rear compartment enclosing a bus means for connection to incoming electrical power cables; and





(f) said rear compartment having recessions in its exterior walls with doors therein providing an access to the bus means.

4,464,704

POLYIMIDE/GLASS-EPOXY/GLASS HYBRID PRINTED CIRCUIT BOARD

Jaken Y. Huie, Apple Valley, Minn., and Dan Jacobus, Glendale, Wis., assignors to Sperry Corporation, New York, N.Y.

Division of Ser. No. 191,651, Sep. 26, 1980, Pat. No. 4,388,136.
This application Feb. 22, 1983, Ser. No. 468,109
Int. Cl.³ H05K *1/03*
U.S. Cl. 361—414 **1 Claim**

1. A hybrid multilayer printed circuit board comprising:

two copper-clad polyimide-glass-base boards, each having a circuit-pattern formed in the copper layer thereof;

a plurality of copper-clad epoxy-glass-base boards, each having a circuit-pattern formed in the copper layer thereof;

said polyimide-glass-base boards sandwiching said plurality of copper-clad epoxy-glass-base boards therebetween and one or more layers of B stage prepreg containing an expoxy resin sandwiched between adjacent ones of said polyimide-glass-base and epoxy-glass-base boards; and,

a plurality of copper-plated through-holes formed in said sandwiching and sandwiched polyimide-glass-base and

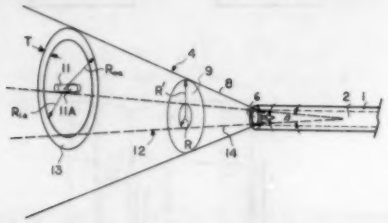
epoxy-glass-base boards for electrically coupling selected portions of the circuit-patterns on said boards.

4,464,705

DUAL LIGHT SOURCE AND FIBER OPTIC BUNDLE ILLUMINATOR

Ross M. Horowitz, 440 E. 79th St., New York, N.Y. 10021

Filed May 7, 1981, Ser. No. 261,519
Int. Cl.³ F21V 7/04; G03B 15/02
U.S. Cl. 362—12 **24 Claims**



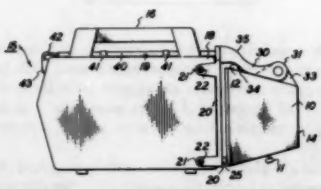
1. A dual light source apparatus for illuminating small animate or inanimate objects which can be photographed comprising a first light source having a linear or point shape spaced apart from a second light source having an annular or substantially annular configuration with both light sources disposed to illuminate a diffusion dome; at least one fiber optic bundle having a distal end and a proximal end, said at least one fiber optic bundle having an acceptance cone such that light emitted within a conical frustrum segment of the acceptance cone extending from the proximal end of the bundle will be effectively conducted through the at least one fiber optic bundle out through the distal end by substantially total reflection; and wherein the proximal end of the at least one fiber optic bundle is disposed at the diffusion dome and within a specific area of the diffusion dome such that the first light source and the second light source are both totally encompassed with the conical segment of the acceptance cone at the proximal end of the fiber optic bundle and wherein the first light source and the second light source are both not encompassed within a conical frustrum segment of a central cone, at the proximal end of the at least one fiber optic bundle, having an apex angle (central angle) of between about 15% and about 35% of the apex angle of the acceptance cone.

4,464,706

LAMP HEAD BRACKET MOUNT FOR GENERATOR

John K. Steeves, Jr., Rochester, N.Y., assignor to Tele-Lite, Inc., Rochester, N.Y.

Filed Jul. 29, 1982, Ser. No. 402,964
Int. Cl.³ B62J 5/08
U.S. Cl. 362—193 **10 Claims**



1. A lamp head bracket mount for mounting a lamp head with a front face and a back on an engine-driven electric generator with a generally rectangular housing, one end of which is generally rectangular, said lamp head and bracket mount, when assembled together and attached to said generator housing, comprising:

a. a bracket that fits closely over said one end of said generator housing;

b. said bracket being vertically oriented and having a frame portion that extends around the perimeter of said end of said generator housing;

c. said bracket having projections that reach horizontally back from said frame portion and are screwed to side regions of said housing near said end of said housing;

d. a non-flexible gooseneck secured to an upper region of said bracket at an upper region of said end of said generator;

e. said gooseneck curving downward in a gooseneck shape as it extends outward from said upper region of said bracket;

f. a free end of said gooseneck forming one part of a supporting knuckle for said lamp head;

g. another part of said supporting knuckle being formed on said lamp head so that said lamp head pivots on a vertical axis through said knuckle;

h. said lamp head being movable between an upwardly aimed position and a folded position in which said front face of said lamp head is folded closely against said bracket and said end of said generator housing for protective storage;

i. a lower region of said bracket having stops limiting said folded position of said front face of said lamp head against said bracket;

j. an underside of said gooseneck sloping downward away from said bracket to provide clearance for said lamp head in said folded position against said bracket closely underneath said gooseneck;

k. an upperside of said gooseneck curving downward from said bracket and upward to said knuckle to provide clearance for tilting said lamp head into said upwardly aimed position; and

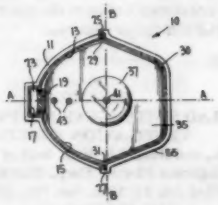
l. said gooseneck being hollow and providing a conduit for electric conductors entering said upper region of said bracket and extending through said gooseneck and said knuckle to said lamp head.

4,464,707

LIGHTING FIXTURE

Louis Forrest, 197 North Ave., Westport, Conn. 06880

Filed Mar. 17, 1982, Ser. No. 359,048
Int. Cl.³ F21S 3/00
U.S. Cl. 362—222 **20 Claims**



1. A lighting fixture for supporting an elongated light source which emits light radially from a longitudinal axis in an angular pattern which exceeds 180°, said fixture comprising:

an elongated reflector having a generally parabolic transverse cross-section with an axis of symmetry, said reflector having a pair of opposite edges which define an imaginary plane intersecting said axis of symmetry; and

lamp socket means for supporting said elongated light source in generally perpendicular relationship with said axis of symmetry, spaced from said reflector, and with said longitudinal axis disposed in said imaginary plane or

on a side of said imaginary plane which is remote from said reflector.

4,464,708

LIGHTING FIXTURE

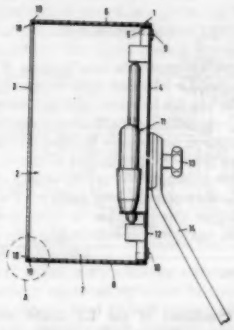
Armin Nüssli, Rodersdorf, and Hans-Peter Hauser, Allschwil, both of Switzerland, assignors to Bron Electronic AG, Allschwil, Switzerland

Filed Sep. 7, 1982, Ser. No. 415,153

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1981, 8128057[U]

Int. Cl.³ F21V *7/00*

U.S. Cl. 362—300 **11 Claims**



1. A lighting fixture comprising a light reflecting fixture case having a case wall made of transparent material, which is coated on the outside with a reflecting and opaque covering, and where the case wall is disposed next to an opening to provide light outflow;

light source disposed in the fixture case; and a diffuser wall covering the light outflow, providing opening of the case and attached to the transparent wall such as to join with the edge of the diffuser wall on all sides flush to the case wall and the case wall reaching to at least the outer face of the adjacent transparent case wall.

4,464,709

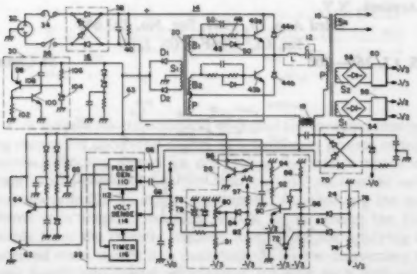
CURRENT AND VOLTAGE PROTECTION FOR A POWER SUPPLY CIRCUIT

Archie M. Barter, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 6, 1982, Ser. No. 366,013

Int. Cl.³ H02H *7/122*

U.S. Cl. 363—16 **4 Claims**



1. An over current protection circuit for a power supply circuit including a switching circuit and a switch driving transformer having a control winding, said protection circuit comprising a first input terminal for connection to both ends of the control winding, a second input terminal for connection to the control winding at a point intermediate its ends, a first resistor connected to said first input terminal, a threshold conduction device connected between said first resistor and said second input terminal, and a silicon controlled switch connected between said first input terminal and said second input terminal, said silicon controlled switch comprising a first transistor having its emitter connected to said first input terminal and its base connected to the junction of said first resistor and said threshold conduction device, a second transistor of opposite conductivity type to said first transistor and having its collector connected to the base of the first transistor, its base connected to the collector of the first transistor and its emitter connected to said second input terminal, and a second resistor connected between the base of the second transistor and said second input terminal, said threshold conduction device remaining non-conductive, and consequently holding said transistors off, so long as the voltage applied to said first input terminal by the control winding remains below a predetermined value, and becoming conductive, and consequently turning said transistors on and shunting said control winding if said voltage attains said predetermined value, said transistors thereafter turning off when said voltage falls to a lower predetermined value.

4,464,710

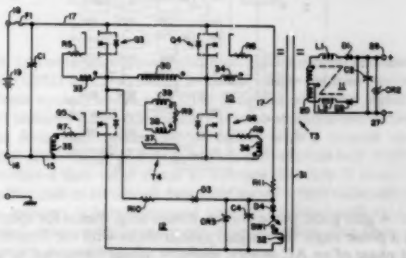
SIMPLIFIED D.C. TO D.C. CONVERTER

Robert P. Gruber, North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 14, 1982, Ser. No. 368,188

Int. Cl.³ H02M *3/335*

U.S. Cl. 363—22 **1 Claim**



1. A D.C. to D.C. converter comprising:

a transformer comprising a pair of E-shaped cores in which the ends of the outer legs are in contact and the ends of the center legs are separated by an air gap, a primary winding being carried on one of said outer legs with a tertiary winding, a center-tapped secondary winding being carried on the other outer leg in having a virtual reactance in said secondary winding due to said air gap;

voltage controlled switch means each having a control electrode and being connected between said primary winding and first and second input terminals whereby D.C. power applied to the input terminal will be directed alternately through the primary winding by switching action of said switch means, said voltage controlled switch means comprising first and second MOSFETs connected serially across said input terminal and third and fourth MOSFETs connected serially across said input terminals, the primary winding of the first transformer being connected from a common point between said first and second MOSFETs to a common point between said third and fourth MOSFETs; switching control means for causing said switch means switching rate to increase or

decrease proportionally with increases or decreases of input voltage to respectively increase or decrease the voltage drop across the virtual reactance in said transformer secondary to regulate voltage and current at said output terminals;

output means comprising first and second diodes connected from respective opposite ends of said secondary winding of said first transformer to one of said output terminals, the other output terminal being connected to a center point of said secondary winding on said first transformer, and a filter capacitor connected across the output terminals; and

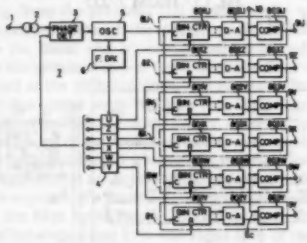
oscillation starting means comrising a start winding carried on the core of said first transformer and being connected serially with a diac and a first voltage dropping means across the input terminal, a first capacitor connected across the series combination including said start winding and said diac, a second diode and a second voltage dropping means serially connected from a common point between said first voltage dropping means and said diac to one end of said primary winding of the first transformer whereby said first capacitor is prevented from charging except when said voltage controlled switch means are all nonconducting.

4,464,711

GATE PULSE PHASE SHIFTER

Yasuhiko Hosokawa, and Shunichiro Onishi, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1982, Ser. No. 379,540
Claims priority, application Japan, May 19, 1981, 56-75948
Int. Cl.³ H02P *13/24*
U.S. Cl. 363—87 **7 Claims**



1. A gate pulse phase shifter, comprising; means for specifying a phase angle for a signal synchronous with the frequency and phase of an AC supply, memory means connected to said phase angle specifying means and having a plurality of addresses, said addresses being specified in sequence by the output of said phase angle specifying means correspondingly to said phase angle, said memory means storing numerical values corresponding to a cosine or sine value at a phase corresponding to said phase angle in a memory element of each address, and comparator means for comparing an output value of said memory means with a phase reference signal and for selectively generating a gate pulse when both coincide.

4,464,712

SECOND LEVEL CACHE REPLACEMENT METHOD AND APPARATUS

Robert P. Fletcher, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

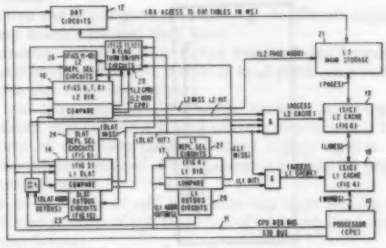
Filed Jul. 6, 1981, Ser. No. 280,759
Int. Cl.³ G06F *13/08, 9/36*
U.S. Cl. 364—200 **12 Claims**

9. In a storage hierarchy for a data processing system, containing at least one CPU having a first level (L1) cache with a L1 directory for receiving storage requests by the CPU and having a dynamic look-aside translator (DLAT) for receiving all virtual storage requests by the CPU, the L1 directory and the DLAT each having a least recently used (LRU) replacement selection means, the hierarchy having a main storage (MS), a second level in the hierarchy comprising:

a second level (L2) cache for storing the same size storage unit that is addressed by the DLAT operating at the L1 level in the hierarchy,

a second level (L2) directory having a plurality of entries respectively associated with different storage units in the L2 cache,

a replacement flag being provided for each entry in the L2 cache directory, each replacement flag having a replacement candidate state or a non-replacement candidate state, the replacement state indicating an associated unit is a



replacement candidate in the L2 cache and the non-replacement state indicating the associated unit is not a replacement candidate,

first means for signalling to the L2 directory a storage address replaced in the DLAT, the DLAT replaced address selecting an entry in the L2 directory and setting the replacement flag for the selected entry to the replacement state,

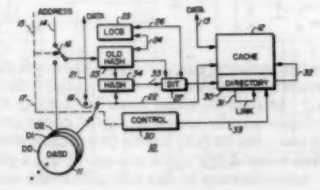
second means for signalling from the L1 level to the L2 directory a storage request address having a hit in the DLAT and a miss in the L1 cache, the storage request address selecting an entry in the L2 cache directory for setting the replacement flag for the selected entry to the non-replacement state.

4,464,713

METHOD AND APPARATUS FOR CONVERTING ADDRESSES OF A BACKING STORE HAVING ADDRESSABLE DATA STORAGE DEVICES FOR ACCESSING A CACHE ATTACHED TO THE BACKING STORE

Michael T. Benhase, and Alan H. Duke, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,648
Int. Cl.³ G06F *9/06, 1/00*
U.S. Cl. 364—200 **14 Claims**



1. The method of indirectly addressing a buffer memory having a first plurality of addressable buffer segments and being coupled to a backing memory having a second plurality

of addressable memory segments distributed among a given plurality of addressable data storage devices, said second plurality of addressable memory segments being more than either said first plurality of buffer segments or said given plurality of data storage devices;

the method employing the numerical relationships of the second plurality of memory segments to the given plurality of data storage devices, comprising the machine-implemented steps of:

establishing a directory with entries for respectively identifying said buffer segments for individually addressing same, and each entry having link elements for linking entries into address classes to form a linked list in each of said address classes;

establishing and maintaining a scatter index table (SIT) for containing signals stored in a given number of addressable fields for pointing to said linked entries of one of said address classes, one signal pointer for each of said address classes in each of said addressable fields;

sequentially addressing said SIT addressable fields for accessing said signal pointers to address said linked entries of said address classes in said directory;

after accessing each of said signal pointers, addressing said linked entries in said directory using said accessed signal pointers, respectively, for accessing said buffer segments which are to store data corresponding to data stored in respective ones of said memory segments in respective ones of said addressable data storage devices identified in said SIT fields; and

each of said linked entries having addresses of said addressable memory segments separated by a number of addresses equal to the quotient of said second plurality divided by said given plurality such that said memory segments of said respective data storage devices bearing the same address within the respective data storage devices are assigned to different ones of said address classes.

4,464,714

SYSTEM FOR TRANSMITTING DIGITAL INFORMATION, CODING ARRANGEMENT FOR USE IN THAT SYSTEM, DECODING ARRANGEMENT FOR USE IN THAT SYSTEM AND RECORD CARRIER FOR USE IN THAT SYSTEM

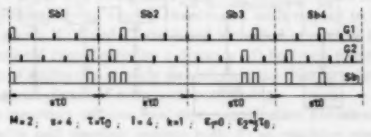
Arie Huijser; Marino G. Carasso, and Johannes J. Verboom, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 28, 1981, Ser. No. 315,793

Claims priority, application Netherlands, Nov. 12, 1980, 8006165

Int. Cl.³ G06F *3/06*; G11B *5/09*; H03K *13/24*

U.S. Cl. 364—200 **36 Claims**



1. A system for transmission of digital information comprising means for receiving digital information in groups of input words, encoding means for converting the inputs words into code words representing the input words, each code word corresponding to an input word, means for applying the code words to a transfer medium, means for receiving the code words from the transfer medium and means for applying the received code words to a decoding means for converting the code words into digital information, wherein each code word has a time duration equal to $s\tau_0$, where s is an integer and τ_0 is a given time interval, and each code word consists of M subgroups, G_m, of I signal positions, t_{mi}, spaced by equal time intervals, τ, where M and I are integers, m is the subgroup, G_m, from 1 to M inclusive, and i is the signal position number within each subgroup G_m from 1 to I inclusive, a number k of the signal positions t_{mi} in each subgroup G_m being always occupied by a signal which is distinguishable from the signals in the unoccupied positions, wherein k is an integer smaller than I ($1 \leq k \leq I-1$), the first signal positions t_{m1} of the subgroups G_m each being located at different time intervals, ϵ_m, from the beginning of the code word, where $0 \leq \epsilon_m \leq \tau$, with the restriction $M \leq 2$ and

$$\sum_{m=1}^{M} \epsilon_m + (I-1)\tau \leq s\tau_0$$

and the group of code words for which it holds that: M=2, I=s=2, k=1, $\tau=\tau_0$ and $\epsilon_2=\epsilon_1+\frac{1}{2}\tau$ excepted.

4,464,715

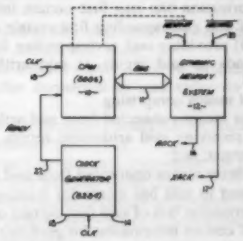
MEMORY ACCESSING METHOD

David A. Stamm, Santa Clara, Calif., assignor to Daisy Systems Corporation, Sunnyvale, Calif.

Filed Feb. 24, 1982, Ser. No. 351,651

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **11 Claims**



1. In a computer system which includes a central processing unit (CPU) and a dynamic memory which requires periodic refresh cycles, where said CPU provides an access signal to said memory when said memory is to be accessed and accesses data from said memory synchronized with a control clock signal after receipt of a ready signal, and wherein said memory provides a data valid signal to indicate that data is ready for reading and an advanced data valid signal which indicates that the memory is being accessed without collision with said refresh cycles, an improved method for accessing data from said memory comprising the steps of:

initiating a timing sequence based on the occurrences of said access signal from said CPU;

allowing said timing sequence to continue if said advanced data valid signal is present during said timing sequence; and,

generating said ready signal at the end of said timing sequence,

whereby the time required to access data is shortened when refresh cycles are not occurring.

4,464,716

DIGITAL DATA PROCESSING SYSTEM USING UNIQUE FORMATTING TECHNIQUES FOR PERFORMING ARITHMETIC ALU OPERATIONS

Charles J. Young, Berlin, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed May 22, 1981, Ser. No. 266,428

Int. Cl.³ G06F *7/48*

U.S. Cl. 364—200 **19 Claims**

1. In a digital computer system including arithmetic processor means for performing arithmetic operations on operands, memory means for storing operands and instructions for di-

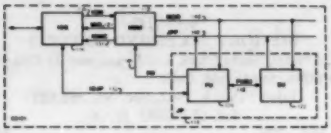
recting said operations, bus means for conducting operands and instructions between said memory means and said processor means, and I/O means for conducting operands between said digital computer system and devices external to said digital computer system, said arithmetic processor means comprising:

arithmetic ALU means for performing arithmetic operations on first certain of said operands expressed in a first format to produce arithmetic results in said first format,

input format means comprising

input multiplexer means connected from said bus means for receiving second certain of said operands expressed in a second format, and

input register means connected from said input multiplexer means and to said inputs of said arithmetic ALU means for (1) extracting first certain information bits from said second certain of said operands, (2) transferring said first certain information bits into first certain information bit positions of said corresponding first certain of said operands and (3) providing said corresponding first certain of said operands to said inputs of said arithmetic ALU means, and



output format means comprising

output register means connected from said arithmetic ALU means for receiving said arithmetic results expressed in said first format, and

output multiplexer means connected from said output register means and to said bus means for transferring second certain information bits of said first certain of said results into second certain information bit positions and providing said results expressed in said second format to said bus means.

4,464,717

MULTILEVEL CACHE SYSTEM WITH GRACEFUL DEGRADATION CAPABILITY

James W. Keeley, Hudson, N.H.; Edwin P. Fisher, North Abington, and John L. Curley, North Andover, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Mar. 31, 1982, Ser. No. 364,052
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **36 Claims**

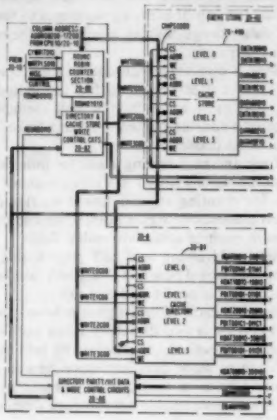
1. A Cache unit for use in a minicomputer system to provide high speed access to main memory data in response to requests, each request containing first and second address portions of a memory address generated by said system, said cache unit comprising:

a cache store organized into a number of levels of at least one group of storage locations, each group of locations within said levels being defined by a different one of said second address portions;

a directory store organized into the same number of levels of said group of storage locations as in said cache store, each location of said directory store for storing a row address designating which one of said levels of said cache store contains data associated therewith and each different group of locations within said directory store levels being defined by a different one of said second address portions;

error detection means coupled to said directory store, said detection means being operative to generate directory error signals for indicating errors associated with said first address portion being accessed from said directory store; and

mode control means being coupled to said error detection means and operatively coupled to said directory store and said cache store, said mode control means being operative in response to a first one of said directory error signals detected during the accessing of data stored in one of said cache store levels to switch said cache unit to a degraded mode of operation, said mode control means when said cache unit is in said degraded mode conditioning said directory store and cache store so as to limit operation only to those directory and cache store levels which were detected as not having any errors.

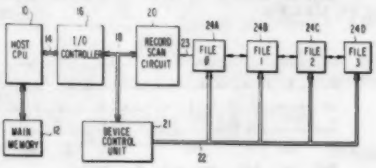


4,464,718

ASSOCIATIVE FILE PROCESSING METHOD AND APPARATUS

Jerry D. Dixon, Boca Raton; Robert H. Farrell, Coral Springs; Gerald U. Merckel, Delray; Jack D. Neely, Boca Raton, all of Fla.; Stephen A. Schmitt; William G. Verdoorn, Jr., both of Rochester, Minn., and Peter B. Bandy, Pine Island, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 30, 1982, Ser. No. 404,200
Int. Cl.³ G06F *15/38*
U.S. Cl. 364—200 **29 Claims**



1. A method for performing a search of data records comprising the steps of:

specifying values of a skip length, key length and data length and providing a search argument corresponding in length to said key length;

providing a serial stream of data from a file having data records to be searched commencing from a predetermined location in said file; and

for each data record received from said file, performing a comparison operation by skipping an initial length of said data of said record from the beginning of said record with said initial length being determined by said skip length, and subsequently repetitively and alternatingly comparing

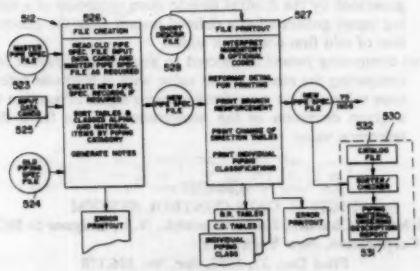
said search argument with a key field of said data having a length specified by said key length and skipping a next succeeding data field of said data having a length specified by said data length.

4,464,719

OFF-LINE METHOD OF DEPICTING PIPING ITEMS OF PIPE SPECIFICATION FILES OF A COMPUTER-AIDED GRAPHICS SYSTEM, WITHOUT DUPLICATIONS OCCURRING

Richard A. Spellmann, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 108,266, Dec. 28, 1979, abandoned.
This application Mar. 15, 1982, Ser. No. 358,063
Int. Cl.³ G06F 15/56
U.S. Cl. 364—300 6 Claims



1. An off-line method of eliminating duplicate piping items associated with a pipe specification file of a computer-aided graphics system for generating a material ordering description report, said file containing unsorted piping items from a plurality of different piping classes but all of said piping items being associated with the same individual pipeline project, said system having two-dimensional pipeline coordinate axes, a planar axonometric representation of a three-dimensional pipeline in which material and non-material piping elements of said pipeline are associated with a multibit digital code representative of a series of workpoints compatible for use within a digital computer system, and workpoints including dominant and subservient points having known coordinates with respect to intersecting axes X, Y and Z, and being identified in relative three-dimensional coordinates by a distance (d) between points and values of angles of a straight line intersecting them as related to orthogonal planes of reference, comprising:

(A) inputting, off-line, said pipe specification file associated with said pipeline project both (i) as machine readable dara words or portions of words, and (ii) as a function of a piping classification index containing different classes of said piping items in a preselected data format, for operation within said system;

(B) scanning said inputted pipe specification file, class record-by-class record, to identify and then eliminate duplications, of said items of said file associated with said project irrespective of class origin; and

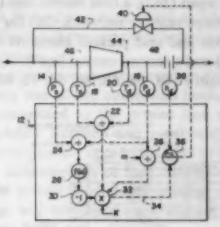
(C) displaying said piping items of (B) in association with a stored code of catalog order descriptions of said items, to generate said material ordering description report whereby a general overview of the project is efficiently provided.

4,464,720

CENTRIFUGAL COMPRESSOR SURGE CONTROL SYSTEM

Suresh C. Agarwal, Euclid, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Feb. 12, 1982, Ser. No. 348,620
Int. Cl.³ F04D 27/02
U.S. Cl. 364—431.02 9 Claims



6. An apparatus for controlling a centrifugal compressor comprising:

a suction line connected to an input of the compressor;

a discharge side line connected to an output of the compressor;

a recirculation line connected between the discharge side and the suction side lines;

a pressure control valve in said recirculation line;

a controller connected to said valve for controlling said valve;

a suction side pressure transmitter for transmitting a suction side pressure value (Ps);

a discharge side pressure transmitter for transmitting a discharge side pressure value (Pd);

an orifice differential pressure transmitter for transmitting an orifice differential pressure from the discharge side (hd) of the compressor;

a control unit connected to said suction and discharge side pressure transmitters and to said controller for calculating a desired value for the orifice differential pressure; and

said controller determining a difference between the actual and calculated differential orifice pressures and using the difference to control said pressure control valve to change the actual differential orifice pressure value to meet the calculated differential pressure value.

4,464,721

DIGITIZED PICKOFF SYSTEM

Joseph V. McKenna, Franklin Lakes, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Feb. 8, 1982, Ser. No. 346,690
Int. Cl.³ G01P 15/08
U.S. Cl. 364—453 7 Claims

1. A digitized pickoff system, particularly for an inertial sensor of an inertial navigation instrument to sense its angular displacement, having at least one pair of mutually spaced pickoff elements, the relative position of which is sensed to provide a corresponding output signal, comprising:

(a) a relaxation oscillator (50, 52, 62, 72, 74, 76) adapted to be sequentially connected to said two pickoff elements (24, 26, 28, 30, 36, 38, 40, 42) so that the resulting oscillating frequency is a function of the air gap and therefore of the position of the respective pickoff element selected,

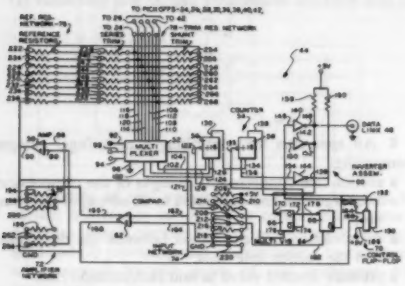
(b) a data converter and frequency measuring means (82, 83, 84) connected to said relaxation oscillator (50, 52, 62, 72, 74, 76) to measure the period of the oscillating frequency, and

(c) a logic circuitry (48, 56, 58, 60, 64, 70, 80, 81, 85, 87) connected to said data converter and frequency measuring means (82, 83, 84) for providing a digital output signal corresponding to the oscillating frequency period differ-

ence as a measure of the relative position of said two pickoff elements (24, 26, 28, 30, 36, 38, 40, 42), wherein said relaxation oscillator comprises:

(a1) a reference resistor network (76) having a resistor (222, 224, 226, 228, 230, 232, 234, 236) for each pickoff element (24, 26, 28, 30, 36, 38, 40, 42) which resistor is adapted to be connected to said pickoff element,

(a2) a comparator (62) having a non-inverting input (164), an inverting input (162), a first output line (166) connected to said reference resistor network (76) for driving said resistor network and said pickoff elements (24, 26, 28, 30, 36, 38, 40, 42) and a second output line (168) connected to said logic circuitry (48, 56, 58, 60, 64, 70, 80, 81, 85, 87),



(a3) a comparator input network (74) having a divider (214, 216) in which the input side of said divider is connected to said reference resistor network (76) and the output side is connected to the non-inverting input (164) of said comparator (62), and

(a4) a multiplexer (52) for selecting said pickoff elements in which the input is connected to said pickoff elements (24, 26, 28, 30, 36, 38, 40, 42), and in which the output is connected to the non-inverting input (162) of said comparator (62) and the input of said logic circuitry (48, 56, 58, 60, 64, 70, 80, 81, 85, 87).

4,464,722

DATA INPUT OR OUTPUT APPARATUS INCORPORATING FUNCTIONAL TESTING

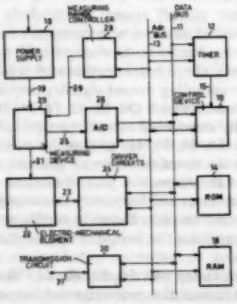
Reimer Von Osten, Siegen, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 15, 1981, Ser. No. 273,549

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022371

Int. Cl.³ G06F *15/20*; G01N *19/02*

U.S. Cl. 364—551 **4 Claims**



1. A data input or output apparatus for a central data processing system, which system comprises a plurality of electromechanical elements, said apparatus comprising:

(a) an electronic control device for the exchange of data and control signals with the centrol data processing system and for generating activation signals for activating at least one electromechanical element;

(b) a power supply device for supplying electric energy to all the electromechanical elements;

(c) a timer for generating timing signals, said timer being connected to the control device;

(d) a measuring range controller, connected to said control device and having an output connected to an input of a measuring device, which measuring device comprises several measuring elements, said measuring range controller being provided with first means for selecting a measuring element under control of a selection signal generated by the control device for the selected electromechanical element to be tested, said measuring device having an output connected to an input of the control device, said measuring device being provided with second means for measuring under control of a first activation signal a supply current drained from the power supply device and for generating a measurement value on the base of said measured supply current after reception of a control signal generated by the control device upon reception of a timing signal generated at a defined instant after the generation of said first activation signal;

(e) comparing means connected to said control device for comparing the measurement value with at least one reference value and for generating an error signal in reaction to a given deviation of the measurement value from the reference value.

4,464,723

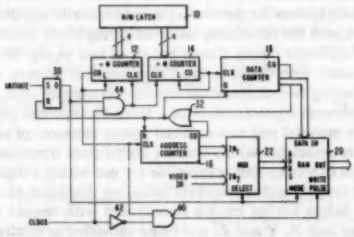
DIGITAL GAIN CONTROL SYSTEM

Michael S. Chartier, East Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 31, 1981, Ser. No. 336,170

Int. Cl.³ H03G *3/00*

U.S. Cl. 364—571 **14 Claims**



1. In a system for processing digital signals, a gain control arrangement comprising:

a source of first clock signals;

a source of second clock signals;

control means for controlling the relative rates of said first and second clock signals;

address counter means, responsive to said first clock signals, for generating digital address words;

data counter means, responsive to said second clock signals, for generating digital input data words;

a digital memory including an address input port, a data input port coupled to receive said digital input data words, and data output means for supplying data words stored in addressed memory locations; and

means for selectively applying said address words to said address input port for conditioning said memory to load said digital input data words into said memory thereby programming the memory with a gain function or selec-

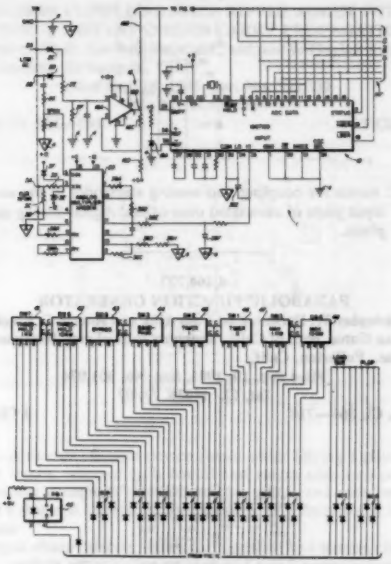
tively applying said digital signals to said address input port and conditioning said memory to output stored data in response to said digital signals applied to the address input port and wherein said output data correspond respectively to said applied digital signals transformed by said gain function.

4,464,724

SYSTEM AND METHOD FOR OPTIMIZING POWER SHED/RESTORE OPERATIONS

George P. Gurr, and Frederick A. Matheson, both of Phoenix, Ariz., assignors to Cyborex Laboratories, Inc., Phoenix, Ariz.

Filed Jun. 17, 1981, Ser. No. 274,488
Int. Cl.³ H02J *3/14*; G06F *15/56*
U.S. Cl. 364—492 **17 Claims**



1. A method for controlling delivery of electrical energy from a power line to an establishment having a plurality of electrical loads in order to maintain the total power delivered to the electrical loads close to a selected power limit, the electrical loads including a plurality of controlled loads which can be electrically connected to and disconnected from the power line in accordance with priorities of the controlled loads by means of a control system, the control system including a plurality of load switching means for controllably connecting the controlled loads to and disconnecting the controlled loads from the power line, the control system also including power measuring means for measuring power delivered from the power line to the electrical loads, said method comprising operating a processor to effect the steps of:

(a) computing and storing a power consumption number for any one of the controlled loads when that controlled load is electrically disconnected from the power line or is electrically connected to the power line;

(b) computing a minor average that represents the average power consumption of the establishment during a first period of time prior to the present time;

(c) computing a major average that represents the average power consumption of the establishment during a second period of time prior to the present time, said second period of time being substantially greater than said first period of time;

(d) comparing said major average to said selected power limit, and comparing said minor average to said selected power limit;

(e) electrically disconnecting the lowest priority controlled load presently electrically connected to the power line, if both said major average and said minor average are greater than said selected power limit;

(f) repeating steps (b), (c), (d) and (e) until either said major average or said minor average is less than said selected power limit;

(g) computing a first power availability number representative of the difference between the selected power limit and said major average;

(h) comparing a stored power consumption number of a first highest-priority one of the controlled loads not presently electrically connected to the power line with said first power availability number and electrically connecting said first highest-priority controlled load to the power line if the power consumption of that controlled load is less than said first power availability number and both said major average and said minor average are less than said selected power limit; and

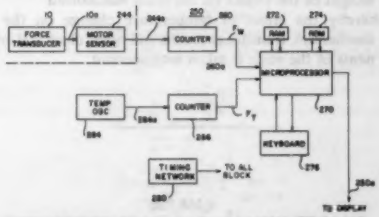
(i) repeating steps (b), (c), (d), (g) and (h) until the highest priority remaining controlled load not presently electrically connected to the power line has a power consumption that is greater than the power availability number computed in step (g).

4,464,725

TEMPERATURE COMPENSATED MEASURING SYSTEM

Dennis K. Briefer, Berlin, Mass., assignor to Setra Systems, Inc., Acton, Mass.

Continuation of Ser. No. 265,088, May 19, 1981. This application Oct. 6, 1983, Ser. No. 539,227
Int. Cl.³ G01G *19/413, 23/365*; G06F *15/20*
U.S. Cl. 364—571 **4 Claims**



1. A digital scale with a temperature compensation system, comprising:

a scale mechanism,

first transducer means for sensing the force on the scale mechanism due to the presence of an object to be weighed and for generating digital force signals indicative thereof,

second transducer means adjacent said scale mechanism for sensing the current ambient temperature and for generating digital temperature signals indicative thereof,

means for generating a series of data indicative of n predetermined discrete ambient temperatures within an operating range,

a set of data indicative of m known weights, where m and n are integers,

means for applying said weights to the scale mechanism in a predetermined sequence at each of said ambient temperatures,

data storage means for storing the digital force values obtained with each known weight at each discrete temperature, along with the corresponding digital temperature signal value,

computer means for obtaining the calibration constants for

said scale by using the known weights as the values of W and the corresponding stored digital force values as the values of F to evaluate the expression

$$W = \sum_{i=1}^{m} a_i(T)F^{i-1},$$

at each temperature and solving the resulting n sets of m simultaneous equations for each of the coefficient terms $a_1(T)$, $a_2(T)$ . . . $a_m(T)$, and then substituting the numerical values of the coefficient terms for each $a_i(T)$ in the set of expressions

$$a_i(T) = \sum_{j=1}^{n} k_{ij}T^{j-1}$$

$i = 1, \ldots, m$,

where k_{ij} are the calibration constants, and substituting the stored corresponding digital temperature signal values for T, and solving each of the resulting m sets of n simultaneous equations for each k_{ij},

said data storage means having means for storing the computer k_{ij} values as a set of m×n calibration constants,

means for computing a numerical value indicative of the corrected weight of an unknown object using the formula

$$\sum_{i=1}^{m} a_i(T)F^{i-1}$$

by employing the stored calibration constants which are the computer polynomial coefficients within each $a_i(T)$ expression, and

means for generating an output signal based on the said computer numerical value representing the corrected weight of the object on the scale mechanism

whereby the effect of temperature change on the scale mechanism, transducer means and other electrical components of the scale is taken into account.

4,464,726

CHARGE DOMAIN PARALLEL PROCESSING NETWORK

Alice M. Chiang, Weston, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 8, 1981, Ser. No. 300,219
Int. Cl.³ G06J 1/00; G06G 7/16
U.S. Cl. 364—606 **11 Claims**

1. A charge domain parallel processing network, comprising:

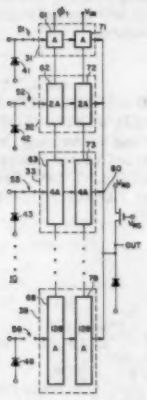
A. a charge coupled device (CCD) comprisng a single multistage tapped delay line including

means for establishing a succession of charge packets therein in response to a succession of applied input signals,

means for shifting said charge packets from stage-to-stage along said delay line, and

a plurality of floating gate sensing electrodes, each of said electrodes overlying one of said stages and being adapted to provide a potential thereon representative of the magnitude of a charge packet currently within its underlying stage,

B. a plurality of charge domain digital-analog multipliers, each of said multipliers including means for generating a charge packet therein having a magnitude proportional to the product of a potential applied to an analog input port and a digital signal, and



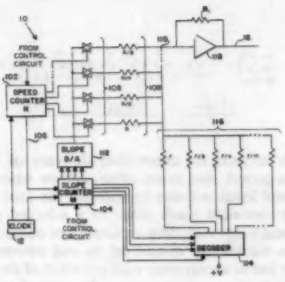
C. means for coupling said sensing electrodes to the analog input ports of associated ones of said digital-analog multipliers.

4,464,727

PARABOLIC FUNCTION GENERATOR

Christopher W. Parkes, East Palo Alto, and Robert C. Franklin, Los Gatos, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Sep. 10, 1981, Ser. No. 301,074
Int. Cl.³ H03K 13/02
U.S. Cl. 364—718 **3 Claims**



1. A parabolic function generator for receiving successive clock pulses and for producing a generator output signal whose value is a parabolic function of the cumulative number of clock pulses received, comprising:

pulse counter means for receiving the clock pulses, for producing a digital counter output comprising a predetermined number of digits, for changing the counter output by one count each time a clock pulse is received, and for producing an N-digit digital mantissa output and an M-digit digital slope output consisting of the N least significant digits and M most significant digits, respectively, of the counter output, wherein M and N represent positive integers whose sum equals said predetermined number of digits in the counter output;

multiplier means, connected to the digital mantissa output and the digital slope output, for producing an analog product signal whose value equals a proportionality constant multiplied by the product of a mantissa number and

a slope number, the mantissa number being the number represented by the digital mantissa output and the slope number being equal to one plus the number represented by the digital slope output;

offset means, connected to the digital slope output, for producing an analog offset signal whose value equals said proportionality constant, multiplied by a quantity equal to the maximum mantissa number plus one, multiplied by said slope number, multiplied by a quantity equal to said slope number minus one, divided by two; and

summing means, connected to the multiplier means and the offset means, for producing the generator output signal proportional to the sum of the product signal and the offset signal.

4,464,728

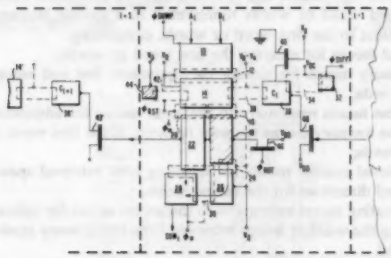
CHARGE COUPLED DEVICE RIPPLE ADDER WITH NEARLY INSTANTANEOUS CARRY PROPAGATION

James G. Nash, Los Angeles, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Sep. 18, 1981, Ser. No. 303,332

Int. Cl.³ G06F 7/50

U.S. Cl. 364—786 **5 Claims**



1. A charge coupled device ripple adder having a plurality of n stages, wherein each one of said stages adds two corresponding addend bits from two n-bit words and each one of said n stages is formed on a semiconductor substrate and comprises:

input charge storing means for receiving and storing charge packets representing each of said two corresponding addend bits, said input charge storing means having a charge storing capacity equivalent to one bit of charge;

carry bit charge injecting means for injecting a carry bit charge packet into said input charge storing means, said carry bit charge injecting means comprises an electrode overlying said substrate adjacent said input charge storing means, means for injecting charge into the portion of said substrate underlying said electrode, and a transistor having a source, drain, and gate, said source and drain connected between said electrode and a voltage source;

first overflow charge storing means for receiving charge from said input charge storing means, said first overflow charge storing means comprises a charge storing diffusion in said substrate, said first overflow charge storing means having a charge storing capacity equivalent to one bit of charge;

second overflow charge storing means for receiving charge from said first overflow charge storing means, said second overflow charge storing means having a charge storing capacity equivalent to one bit of charge, and said first overflow charge storing means diffusion located between said input charge storage means and said second overflow charge storing means;

sum bit charge storing means for receiving a sum bit charge packet from either one of said input charge storing means and said second overflow charge storing means in synchronism with a clock signal ϕW; and

charge transfer blocking means for blocking the transfer of charge between said input charge storing means and said sum bit charge storing means, said charge transfer blocking means comprises a floating gate overlying said substrate and insulated therefrom and located between said input charge storage means and said sum bit charge storing means, said charge transfer blocking means floating gate being connected to said first overflow charge storing means charge storing diffusion to prevent charge transfer between said input charge storing means and said sum bit charge storing means whenever charge overflows into said first overflow charge storing means, said charge transfer blocking means floating gate also being connected to a carry bit charge injecting means transistor gate of a next succeeding stage so as to cause the carry bit charge injecting means of said next succeeding stage to inject a succeeding stage carry bit charge packet in response to an overflow of charge into said first overflow charge storing means, said carry bit charge injecting means transistor gate connected to a charge transfer blocking means floating gate of a next previous stage.

4,464,729

BINARY MOS CARRY-LOOK-AHEAD PARALLEL ADDER

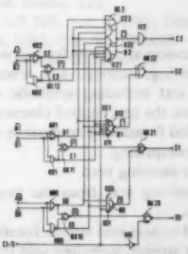
Daniel Mlynek, Wolfgantzen, France, assignor to ITT Industries, Inc., New York, N.Y.

Filed Oct. 14, 1981, Ser. No. 311,351

Claims priority, application European Pat. Off., Nov. 15, 1980, 80107091.3

Int. Cl.³ G06F 7/50

U.S. Cl. 364—787 **6 Claims**



1. A monolithic integrated binary MOS carry-look-ahead parallel adder for adding two numbers each represented in an n-digit binary code, where n is an integer greater than one comprising:

n stages, one for each of the n digit signals of said two numbers, each of said n stages including

a NOR gate to combine associated inverted digit signals of said two numbers to provide a D signal,

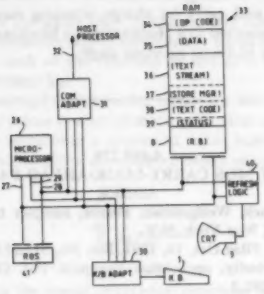
a NAND gate to combine associated inverted digit signals of said two number to provide an E signal,

a first EXCLUSIVE-NOR gate having a first input coupled to said NOR gate a second input coupled to said NAND gate and responsive to said D and E signals to provide an inverted subtotal signal, at an output and a second EXCLUSIVE-NOR gate having a first input coupled to said first EXCLUSIVE-NOR gate output and having a second input coupleable to the next lower weight stage of said n stages where there is a lower weight stage and responsive to said inverted subtotal signal and for stages other than the lowest weight stage an inverted carry signal of said next lower weight stage to provide a digit sum signal.

4,464,730
TEXT PROCESSING APPARATUS WITH EDITING OF STORED DOCUMENT AT EACH KEYSTROKE

Stephen G. Lawrence, Southampton, and Brian H. Middleton, Winchester, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 12, 1981, Ser. No. 273,273
Claims priority, application European Pat. Off., Jun. 30, 1980, 80302196
Int. Cl.³ G06F 9/00
U.S. Cl. 364—900 4 Claims



1. A text processing apparatus for use with a host processor capable of receiving, storing, and transmitting previously keyed text, the text including symbolic characters and text control characters, the text control characters including multi-character extended formatting commands affecting the format of a document, comprising

a keyboard for entering text,

means for receiving text from the host processor in text stream form,

means coupled to said text stream receiving means for storing said text stream, including said control characters, in said data stream format, editing means connected for receiving keystroke signals from said keyboard and including means for modifying said text stream stored in said storing means in accordance with said keystroke signals on a keystroke-by-keystroke basis, and

a display for displaying said stored text,

wherein the improvement comprises,

text segmenting means for dividing said received text stream into segments and for chaining said segments,

each segment having a variable-length of text and having a predetermined maximum length of text, the area within the maximum length not occupied by text being designated a slack area,

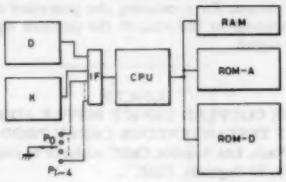
each segment having at most one extended formatting command therein and segments not having an extended formatting command therein having a slack area not containing data and therefor available for inserts, and

formatting means for reading said segmented text stream from said text store and mapping the contents thereof onto said display and means in said editing means for invoking said formatting means when a text editing step has been completed.

4,464,731
VARIABLE RETRIEVAL SPEED/DIRECTION ELECTRONIC TRANSLATOR

Kosuke Nishimura, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1981, Ser. No. 326,710
Claims priority, application Japan, Dec. 9, 1980, 55-174403
Int. Cl.³ G06F 15/38
U.S. Cl. 364—900 20 Claims



1. An electronic translator of the type wherein a first word or words represented in a first language are entered to obtain a second word or words represented in a second language equivalent to the first word or words, comprising;

input means for entering the first word or words;

memory means for storing the equivalent first and second words;

access means responsive to the input means for addressing the memory means to cause retrieval of the first word or words;

retrieval control means for selecting both retrieval speeds and directions for the access means;

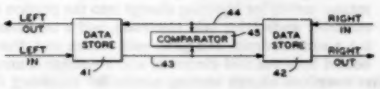
indicating means responsive to the access means for indicating the word or words retrieved from the memory means; and

translation means for causing the access means to cause the retrieval of the second word or words equivalent to a selected first word or words previously retrieved from the memory means.

4,464,732
PRIORITIZED SORTING SYSTEM

Kim K. Clark, Anaheim, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 19, 1982, Ser. No. 359,730
Int. Cl.³ G06F 7/06
U.S. Cl. 364—900 16 Claims



1. A priority sorting system for sorting information on a priority basis, said information having priority values associated therewith, said system comprising:

at least first, second, third and fourth data stores each having at least one input for writing information therein and at least one output for reading information thereout, said at least one output of said first data store connected to said at least one input of said second data store, said at least one output of said second data store connected to said at least one input of said third data store, and said at least one output of said third data store connected to said at least one input of said fourthh data store;

a first comparaor connected to said first and second stores for comparing information stored in said first and second data stores and for conditionally swapping said informa-

tion between said first and second data stores dependent upon said priority basis;

a second comparator connected to said third and fourth data stores for comparing information stored in said third and fourth data stores and for conditionally swapping said information between said third and fourth data stores dependent upon said priority basis; and,

swapping control means connected to said data stores and to said comparators for directing conditional swapping of said information between said data stores dependent upon said priority basis.

4,464,733

OFFICE SYSTEM COMPRISING TERMINALS, A DATA PROCESSOR AND AUXILIARY APPARATUS AND A SWITCHING DEVICE FOR MASS DATA TRANSPORT BETWEEN THE AUXILIARY APPARATUS

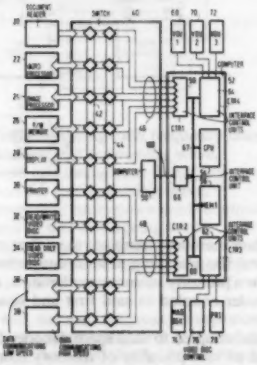
Jan S. Misker, and Jacobus A. de Vos, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 20, 1981, Ser. No. 323,620

Claims priority, application Netherlands, Jul. 23, 1981, 8103477

Int. Cl.³ G06F *15/16, 15/20, 3/00, 9/00*

U.S. Cl. 364—900 **4 Claims**



1. An office system for the processing of a data file by means of at least two simultaneously operational terminals (VDU1, VDU2), common processor means (CPU), a first number of peripheral apparatus (**74, 78**), and a data bus (**67**) which interconnects the processor means, the terminals and peripheral apparatus, characterized in that for the updating of a document file and the mass data transport between a second number of auxiliary apparatus including,

a document reader (**20**) with pixel-wise scanning of a document field according to a scan pattern;

a read/write memory (**26**) for the reversible storage of the total pixel information of said document filed in accordance with said scan pattern;

a display device (**28**) for the display of the total pixel information of said document field;

a memory device (**32**) comprising a digital video disc with optical write and read means for the filing of the total pixel information of said document field;

a switching device (**40**) is provided which comprises:

a switching module (**106**) for each of said auxiliary apparatus which comprises a first connection (**108**) for the relevant auxiliary apparatus, the second connection (**110**) to said data bus, a third connection (**116**) and a control connection (**112**), the first and the second connection being transparently interconnected in a first state of the switching module, while the first and the third connection are interconnected in a second state of the switching module;

at least one first (**42**) and one second (**44**) internal data highway whereto all said third connections are coupled;

a control member (**50**) which comprises a first control line (**100**) which is connected to the data bus in order to receive control and selection signals and to dispatch reply signals and which also comprises associated control outputs (**114**) which are connected to the control connections of associated switching modules in order to carry a selection signal for activating said first or said second state as desired, and in order to form in said second state two coexistent pairs from four of said second number of auxiliary apparatus, said pairs being interconnected via said first and said second internal data highway, respectively, said control member furthermore comprising a signalling input for receiving a termination signal after termination of a mass data transport and for releasing the relevant data highway in reaction thereto;

a data flow control element (**174**) for realizing a mass data transport of the pixel information of a document field in said second position of the switching module, synchronized in a handshake by synchronization signals which are also carried on the internal data highway.

4,464,734

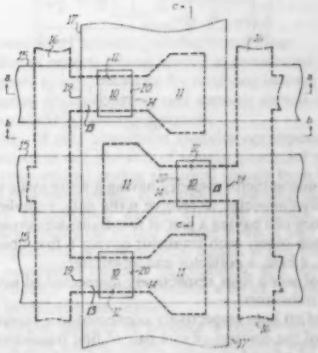
SEMICONDUCTOR DYNAMIC MEMORY CELL ARRAY WITH WORD LINES EXTENDING INTO WINDOWS OF CAPACITOR PLATE

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 137,705, Apr. 7, 1980. This application Jul. 16, 1982, Ser. No. 399,038

Int. Cl.³ G11C *11/24*

U.S. Cl. 365—51 **9 Claims**



1. A semiconductor memory device of the type including an array of one-transistor dynamic memory cells in a face of a semiconductor body, comprising:

a plurality of semiconductor regions in said face of the semiconductor body, said regions being laterally spaced from one another along said face, each region providing one end of a source-to-drain path of an access transistor in each cell,

conductive means extending laterally along said face insulated therefrom by an insulating layer and providing a plurality of capacitor areas in said face, one capacitor area for each of said cells, and

a plurality of elongated conductive strips at said face overlying said regions providing gates of access transistors for each of said cells and extending into windows in said conductive means, the strips providing the gate of an access transistor for each of said cells.

4,464,735

SEMICONDUCTOR MEMORY

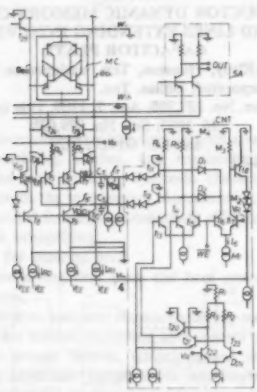
Kazuhiro Toyoda, Yokohama; Yasuhisa Sugo, Tokyo, and Katuyuki Yamada, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 11, 1981, Ser. No. 329,922

Claims priority, application Japan, Dec. 25, 1980, 55-184564

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—190 **3 Claims**



1. A semiconductor memory having a write cycle and being operatively connected to receive write data, including:

a memory cell having a pair of first transistors cross coupled to each other, each transistor having a first conductivity type, a base, a collector and an emitter;

a pair of word lines respectively connected to said pair of first transistors;

a pair of bit lines respectively connected to a corresponding one of the emitters of said pair of first transistors;

a pair of second transistors, each of said pair of second transistors having a conductivity type different than said first conductivity type, having a base, having a collector, and having an emitter connected to a respective one of said pair of bit lines; and

means for providing complementary signals responsive to said write data, said complementary signals being applied to respective ones of the bases of said pair of second transistors so that a write current flows from the memory cell to a voltage source means via one of said pair of bit lines and one of said pair of second transistors only during the write cycle.

4,464,736

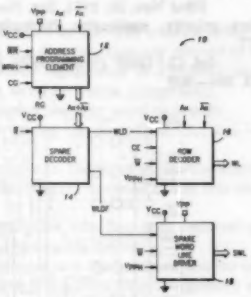
IN-PACKAGE E²PROM REDUNDANCY

Stephen L. Smith, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 23, 1982, Ser. No. 421,748

Int. Cl.³ G11C *11/40, 13/00*

U.S. Cl. 365—200 **7 Claims**



1. A redundant memory circuit having a first and a second address terminal for providing at least one redundant memory element for a plurality of memory elements, comprising:

a spare decoder coupled to said first and second address terminal;

a row decoder coupled to said spare decoder for selecting word lines of said plurality of memory elements;

a spare word line driver coupled to said spare decoder for selecting spare word lines of said plurality of memory elements; and

programmable means coupled between said spare decoder and said first and second address terminals, for providing an output logically determined from a first address on said first address terminal and a second address on a said second address terminal wherein said programmable means is electronically programmable and electronically erasable in-package.

4,464,737

METHOD FOR MIGRATION OF SEISMIC REFLECTION WAVES

Keh Pann, Richardson, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,254

Int. Cl.³ G01V *1/28*

U.S. Cl. 367—49 **2 Claims**

1. A method for producing a migrated seismic depth section

from seismic data representing the occurrence times of seismic energy from a plurality of spaced sources and reflected from subsurface interfaces, comprising;

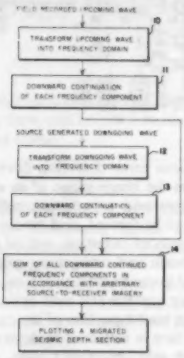
(a) providing a source of seismic energy for transmitting seismic energy waves downward into the earth,

(b) computing the source generated downgoing seismic wave,

(c) recording the upcoming seismic wave reflected from subsurface interfaces within the earth,

(d) transforming said recorded downgoing wave into the frequency domain,

(e) transforming said recorded upcoming wave into the frequency domain,


FIELD RECORDED UPCOMING WAVE
10
TRANSFORM UPCOMING WAVE INTO FREQUENCY DOMAIN
11
DOWNWARD CONTINUATION OF EACH FREQUENCY COMPONENT
SOURCE GENERATED DOWNGOING WAVE
12
TRANSFORM DOWNGOING WAVE INTO FREQUENCY DOMAIN
13
DOWNWARD CONTINUATION OF EACH FREQUENCY COMPONENT
14
SUM OF ALL DOWNWARD CONTINUED FREQUENCY COMPONENTS IN ACCORDANCE WITH ARBITRARY SOURCE-TO-RECEIVER IMAGERY
PLOTTING A MIGRATED SEISMIC DEPTH SECTION

(f) downward continuing each frequency component in the signal band for said downgoing wave,

(g) downward continuing each frequency component in the signal band for said upcoming wave,

(h) time reversing each downward continued frequency component of said downgoing wave,

(i) summing all time reversed downward continued frequency components of said downgoing wave and all downward frequency components of said upcoming wave, and

recording said summed frequency components to produce an arbitrary source-to-receiver migrated seismic section representing the actual depth of the subsurface interfaces.

4,464,738

SONAR DISTANCE SENSING APPARATUS

Stanislaw B. Czajkowski, London, England, assignor to Sonic Tape Public Limited Company, London, England

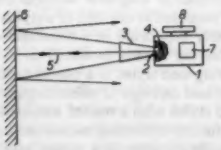
PCT No. PCT/GB81/00025, 371 Date Oct. 20, 1981, 102(e) Date Oct. 20, 1981, PCT Pub. No. WO81/02472, PCT Pub. Date Sep. 3, 1981

PCT Filed Feb. 23, 1981, Ser. No. 314,090

Claims priority, application United Kingdom, Feb. 22, 1980, 80 06161

Int. Cl.³ G01S *15/14, 7/52*

U.S. Cl. 367—97 **11 Claims**



1. Distance sensing apparatus comprising a measurement signal generator including exciting means for generating pulsed electrical signals and a transducer responsive to the exciting means for radiating pulsed sonic or ultrasonic measurement signals along a measurement path, said transducer also receiving and converting into return electrical signals reflections of said measurement signals from a remote surface back along the measurement path, a time measurement device for determining the time lapse between radiation of a measurement signal pulse and receipt of a reflected signal, thereby to provide a distance signal which will be representative of the path distance between the apparatus and said surface, an amplifier for increasing the amplification of said return electrical signals as a function of the time elapsed from radiation of a measurement signal pulse, said amplifier including an attenuator and means coupled to said attenuator for reducing the attenuation of the attenuator as a function of time elapsed from the radiation of a measurement signal pulse and a sound lens or sound horn provided adjacent to the transducer to create a narrow directional beam sonic or ultrasonic signal, said beam having a projection angle of about 3° or less.

4,464,739

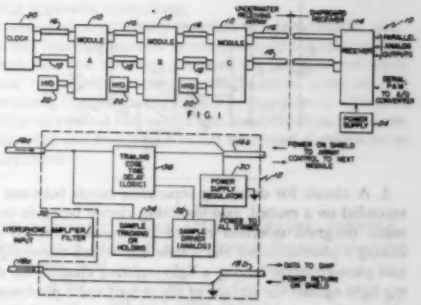
SAMPLED TOWED ARRAY TELEMETRY

Arthur L. Moorcroft, Norwich, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 26, 1982, Ser. No. 402,016

Int. Cl.³ G01S *3/80*

U.S. Cl. 367—130 **6 Claims**



1. A towed array telemetry system comprising:

a plurality of sensing means, spaced at preselected intervals along said towed line array, for receiving incoming acoustic signals and converting said acoustic signals into proportional analog electrical signals;

a plurality of data acquisition modules corresponding and connected to said plurality of sensing means, for receiving said proportional analog electrical signals from said plurality of sensing means, continuously tracking said plurality of proportional analog electrical signals, simultaneously holding the instant voltage levels of said plurality of proportional analog eletrical signals at said plurality of data acquisition modules on command and transmitting said plurality of voltage levels as a series of pulse amplitude modulated data signals;

timing means, adapted to produce a control pulse having leading and trailing edges, for controlling said simultaneous voltage level holding at said plurality of data acquisition modules and the serial transmitting of said held voltage levels at said plurality of data acquisition modules as said pulse amplitude modulated data signals;

receiving means for receiving said serial pulse amplitude modulated data signals from said plurality of data acquisition modules, counting said pulses to provide data channel identification and processing said signals in a form suitable for beamforming;

control cable means for serially connecting said timing means, said plurality of data acquisition modules, and said receiving means together respectively;

data transmission cable means, being generally parallel to said control cable means, for serially connecting said plurality of data acquisition modules and said receiving means, said data transmission means providing the path over which said pulse amplitude modulated signals are transmitted; and

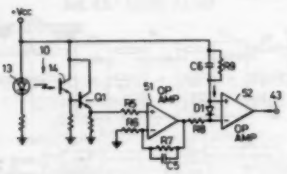
power supply means for providing power to operate said timing means, said plurality of data acquisition modules and said receiving means.

4,464,740

SEPARATION BAND DETECTING CIRCUIT IN AN AUTOMATIC PROGRAM SELECTION RECORD PLAYER

Tsuyoshi Ono, Yamato, and Fumiaki Ohno, Fujisawa, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 13, 1982, Ser. No. 377,846
Claims priority, application Japan, May 18, 1981, 56-74618
Int. Cl.³ G11B *3/38, 17/06*
U.S. Cl. 369—41 6 Claims



1. A circuit for detecting separation bands between bands recorded on a record, said detecting circuit being in an automatic program selection record player, said record player having a photodetector and a tone arm which move together, said photodetector having a light-emitting element for directing light against the surface of the record and a photosensitive element for receiving the light which is reflected from the record surface and for producing an output signal which is in accordance with quantity of the reflected light which is received by said photosensitive element, said detecting circuit comprising:

an operational amplifier having first and second input terminals, said first input terminal being supplied with the output signal of said photodetector, said output signal including a D.C. component; and

a time constant circuit having a predetermined time constant and including a diode which is coupled between said first and second input terminals of the operational amplifier, said second input terminal being coupled through said time constant circuit to a potential source;

means including said time constant circuit for supplying a threshold voltage to said second input terminal of the operational amplifier, said threshold voltage undergoing a gradual voltage level change with said predetermined time constant to follow a voltage level change in the output signal of said photodetector, and

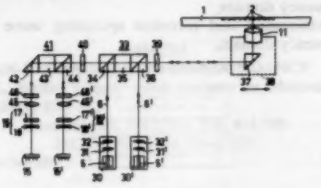
means including said operational amplifier for inverting an output signal in response to a sudden large level change in the output signal of said photodetector, said sudden large level change occurring with a period which is shorter than said predetermined time constant and accompanying a voltage change to a voltage level which exceeds the level of said threshold voltage.

4,464,741

OPTICAL FOCUSING-ERROR DETECTION DEVICE

Klaas Compaan, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 3, 1982, Ser. No. 354,324
Claims priority, application Netherlands, Dec. 11, 1981, 8105579
Int. Cl.³ G11B *7/00*
U.S. Cl. 369—45 7 Claims



1. An optical focus error detection device for determining deviations between the image plane of an objective system in an optical apparatus and a radiation reflecting surface on which an image is to be formed, said device comprising means for producing a beam of radiation, optical means arranged in the path of said beam and comprising said objective system which focuses said beam to a first spot on said reflecting surface, said reflecting surface and said optical means being arranged such that at least a portion of the radiation incident on said reflecting surface is reflected back to said optical means and passes through said objective system, said optical means forming a non-collimated beam from said reflected radiation, a radiation sensitive detector comprising four sub-detectors, and an astigmatic system arranged in the path of said non-collimated beam so as to form a second spot on said detector having a shape which is dependent on the deviation of said reflecting surface from said image plane so that said sub-detectors supply output signals which are representative of said shape of said second spot and thus of said deviation, said astigmatic system comprising two cylindrical lenses having mutually perpendicular cylindrical axes and different lens powers, the positions of said cylindrical lenses relative to said objective system and said powers of said lenses being such that the beam emerging from said cylindrical lenses has the same convergence in two mutually perpendicular planes and the images of the pupil of said objective system formed by said cylindrical lenses are disposed symmetrically relative to the plane of said detector.

4,464,742

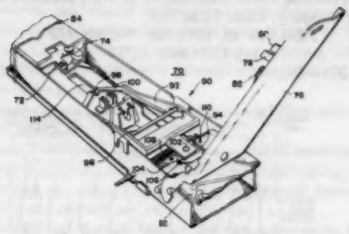
STYLUS CLEANER PAD ORIENTATION IN DISC RECORD PLAYER

Eric A. Brauer, Danville, Ind., assignor to RCA Corporation, N.Y.

Filed Sep. 28, 1982, Ser. No. 426,010
Int. Cl.³ G11B *3/58*
U.S. Cl. 369—71 3 Claims

1. In a record player including a pickup stylus subject to engagement with a turntable-supported record for recovering prerecorded information disposed thereon during playback; said stylus being mounted at one end of a stylus arm having the other end yieldably supported in a translatable carriage; said player further having means mounted in said carriage for lifting and lowering said stylus in a manner causing said stylus to protrude from said carriage to effect engagement and disengagement of said stylus with a record mounted on said turntable; said player further including means mounted in said carriage for selectively cleaning said stylus; said stylus cleaning means comprising a holder carrying a stylus wiping element, and a selectively-actuated means for causing motion of said holder while said stylus is rigidly held in said carriage at a position spaced from a turntable-mounted record such that said

wiping element cleans said stylus; wherein said wiping element is in the form of a piece of compliant sheet having an edge



secured to said holder such that the free edge of said compliant sheet extends away from said holder for selectively wiping said rigidly-held, spaced stylus.

4,464,743

RECORD PLAYING APPARATUS

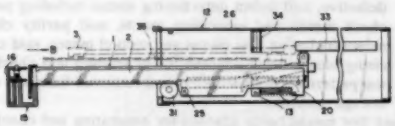
Kazuyuki Takizawa, Kobayashi; Takao Izumi, Tokyo, and Makoto Kodama, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 323,458, Nov. 20, 1981, abandoned. This application Nov. 2, 1983, Ser. No. 548,031

Claims priority, application Japan, Nov. 28, 1980, 55-166624; Dec. 12, 1980, 55-177548[U]

Int. Cl.³ G11B *1/00*

U.S. Cl. 369—75.2 **19 Claims**



7. Record playing apparatus comprising:

housing means having an opening at the front thereof;

record carrier means for supporting a record disc on the top thereof;

means mounting said record carrier means in a lower portion of said housing means for movements relative to the latter between a first carrier position in which said record carrier means is contained in said housing means with a front portion of said record carrier means situated in a lower portion of said opening, and a second carrier position in which said record carrier means is at least partly withdrawn forwardly from said housing means through said opening;

cover means located adjacent said front portion of the record carrier means;

mounting means mounting said cover means on said record carrier means for said movements therewith and for movements relative to said record carrier means between a first cover position in which said cover means extends above said top of the record carrier means for closing the remainder of said opening above said lower portion of the latter with said record carrier means in said first carrier position, and a second cover position in which said cover means is disposed below said top of the record carrier means at said front portion of the latter for ease of access to said top of the record carrier means when exchanging a record disc thereon with said record carrier means in said second carrier position; and

cover control means operative in response to said movements of the record carrier means for selectively disposing said cover means in said first and second cover positions when said record carrier means is in said first and second carrier positions, respectively.

4,464,744

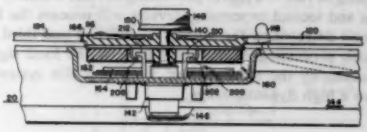
VIDEO DISC PLAYER HAVING TURNTABLE RETENTION MECHANISM

James H. Helm, Elwood, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 26, 1983, Ser. No. 461,068

Int. Cl.³ G11B *3/60, 17/04*

U.S. Cl. 369—264 **7 Claims**



1. In a disc record player for recovering prerecorded signals from a disc record supported on a turntable rotatably mounted to the housing of said player; said player having means for driving said turntable; said player further including a mechanism for stopping said turntable at a certain angular position when said turntable driving means is switched off; said player further having a mechanism for holding said turntable at said angular position while said player remains turned off; turntable retaining apparatus comprising:

a retaining element fixedly attached to said turntable; and

a further retaining element securely mounted to said housing such that said retaining elements are in alignment when said turntable is occupying said angular position; said retaining elements being subject to engagement with each other to prevent removal of said turntable from said housing when said turntable is raised while said elements are in alignment.

4,464,745

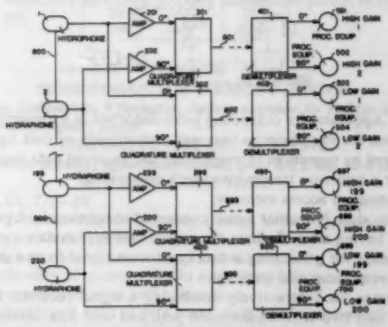
HIGH DYNAMIC RANGE MULTIPLEXING SYSTEM

William T. Rusch, Hollis, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Nov. 27, 1981, Ser. No. 325,400

Int. Cl.³ H04J *11/00*

U.S. Cl. 370—19 **11 Claims**



1. A system for the transmission of electrical information from an array of sensing devices to processing devices via a plurality of transmission paths that are coupled to the output of an adjacent pair of sensing devices said system comprising:

(a) a first and second quadrature multiplexer located in each transmission path, said first multiplexer has two high gain channels that are respectively coupled to the output of the first and second sensing devices, and said second multi-

plexer has two low gain channels that are coupled to the output of the first and second sensing devices; and

(b) a first and second quadrature demultiplexer, said first demultiplexer demultiplexes the output of said first multiplexer and transmits the signals received from the first sensing device to a first processing device and the signals received from the second sensing device to a second processing device, said second demultiplexer demultiplexes the output of said second multiplexer and transmits the signals detected by the first sensing device to a third processing device and the signals detected by the second sensing device to a fourth processing device, whereby said first and second processing devices will process the faint signals detected by the sensing devices and said third and fourth processing devices will process the loud signals detected by the sensing devices causing this system to have a high dynamic range.

4,464,746

ARRANGEMENT FOR CORRECTING PULSE DISTORTION IN HOMOCHRONOUS DATA TRANSMISSION

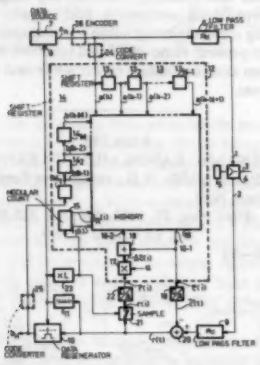
Wilfred A. M. Snijders; Johannes J. W. Kalfs, and Petrus J. Van Gerwen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 26, 1982, Ser. No. 342,984

Claims priority, application Netherlands, Feb. 11, 1981, 8100650

Int. Cl.³ H04B *3/20*

U.S. Cl. 370—32 **1 Claim**



1. Apparatus for correcting pulse distortion in a transmission system for simultaneous two-way transmission of data signals formed by sequences of transmitted and received data symbols over a two-wire transmission path comprising:

a random access memory;

a modulo L counter means connected to receive clock pulses having a rate L times the rate of said system data signals;

means for generating a data correction signal from a signal read from said memory;

means for subtractively combining a signal received from said two-wire transmission path and said data correction signal whereby a corrected data signal is obtained;

a data regenerator connected to produce a regenerated data signal from said corrected data signal;

means for addressing the memory at uniform time intervals by address code words determined by the transmitted data signals, said regenerated data signal, and the count of said modulo L counter; and

means for changing the contents of an addressed memory location according to the corrected data signal.

4,464,747

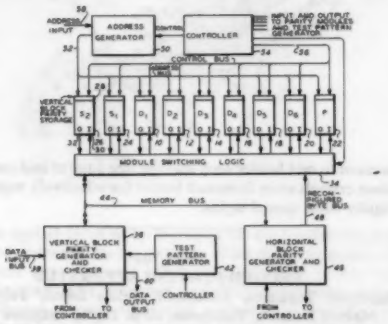
HIGH RELIABILITY MEMORY

Alan I. Groudan, Harrington Park; Garry E. Pitt, Towaco, and Lell E. Barnes, North Caldwell, all of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Feb. 18, 1982, Ser. No. 349,873

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—50 **4 Claims**



1. A memory system, comprising:

a multiple bit memory subdivided into a plurality of data storage matrices having horizontal rows and vertical columns of uniform length, respectively;

addressing means for said matrices;

input and output means for said matrices;

means for determining when one of the matrices becomes defective, said defect determining means including parity check means and exercising means, said partity check means including first means and second means, said exercising means being adapted for generating and checking test patterns that are stored in and retrieved from said date storage matrices;

said first means being adapted for generating and checking vertical block parity of each said matrix;

said first means comprising at least one vertical parity storage row for each said matrix where said row has a length equal to said length of said horizontal rows;

said second means being adapted for generating and checking horizontal block parity of said matrices, said second means comprising a horizontal parity storage matrix identical to said matrices;

at least on spare matrix identical to said storage matrices; and

means for substituting said spare matrix for one of said matrices when said one of said matrices becomes defective, said substituting means having input means for receiving input data which enables the substituting means to determine when said one of said matrices becomes defective.

4,464,748

REMOTE DATA LINK SWITCHING ARRANGEMENT

Krikor A. Krikor, Glendale, Ariz., assignor to GTE Automatic Electric Inc., Northlake, Ill.

Filed Oct. 26, 1982, Ser. No. 436,875

Int. Cl.³ H04J *3/12*

U.S. Cl. 370—58 **8 Claims**

1. In a telephone switching system having a plurality of switching offices interconnected to transmit digital and analog data between said switching offices, apparatus for switching between said transmitted analog data and said transmitted digital data, said apparatus comprising:

said plurality of switching offices including at least a first and a second switching office;

a plurality of T1 spans, one particular T1 span connected between said first and second switching offices;

a plurality of modems, one particular modem connected

between said first and second offices, each said modem operated to produce an analog clock signal;

a digital trunk unit connected to at least one of said plurality of T1 spans and each said digital trunk unit operated to transfer said digital data between said first switching office and said connected ones of said plurality of T1 spans;

a first CPU connected to said first switching office and operated to receive and examine messages from said first switching office;

a clock connected to said first switching office and operated to produce a digital clock signal;

means for requesting connected to said first switching office and operated to produce a message indicating whether digital or analog data is to be transmitted between said first and second switching offices;

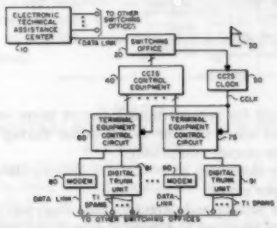
a plurality of terminal equipment control circuits, each terminal equipment control circuit connected to said first CPU, to said clock, to said one digital trunk unit and to said one modem;

each terminal equipment control circuit comprising:

a second CPU connected to said first CPU and operated to receive said received message from said first CPU;

said second CPU further operated to send data to and receive data from said connected modem and said digital trunk unit;

means for storing connected to said second CPU for indicating whether analog or digital data is to be transmitted between said second switching office and said terminal



equipment control circuit, said means for storing operated in response to said second CPU to produce a steering signal of a first value for analog data transmission or to produce a steering signal of a second value for digital data transmission;

multiplexing means connected between said second CPU, said modem, said digital trunk unit and said means for storing, said multiplexing means operated in response to said first value of said steering signal to transmit said analog data and said analog clock signal from said connected modem to said second CPU or alternatively operated in response to second value of said steering signal to transmit said digital data and said digital clock signal from said digital trunk unit to said second CPU;

first gating means connected to said second CPU, to said modem, to said digital trunk unit and to said clock, said first gating means operated in response to said means for storing and to said sent data of said second CPU to produce digital data in response to said steering signal of said first value or to produce analog data in response to said steering signal of said second value; and

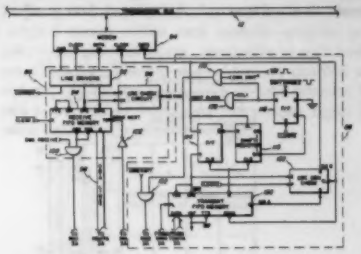
second gating means connected to said first gating means, to said modem, to said digital trunk unit and to said means for storing and said second gating means operated to transmit said produced digital data to said digital trunk unit in response to said steering signal of said second value or said second gating means operated to transmit said produced analog data to said modem in response to said steering signal of a first value.

4,464,749

BI-DIRECTIONAL TOKEN FLOW SYSTEM

Mehmet E. Ulug, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 24, 1982, Ser. No. 351,821
Int. Cl.³ H04J 6/00
U.S. Cl. 370—85 **34 Claims**



1. A bus communication system comprising:

a data transmission bus;

a plurality of bus interface units (BIUs) each connected to the transmission bus at spaced locations along said bus and each having a unique address indicative of its location along said bus, each of said BIUs being capable of transmitting packets of data onto said bus and receiving packets of data from said bus;

first and second ones of said BIUs located at opposite ends of said transmission bus being token generators which initiate respective left and right token passing sweeps by placing one of a start-up packet and an information packet on said bus;

each respective said BIU including: means for calculating a token time interval unique to said respective BIU each time said respective BIU receives one of the information and start-up packets transmitted by an upstream BIU, said token time interval being calculated as a function of the difference between the address of said respective BIU and the address of said upstream BIU;

timing means for generating a token receipt signal at the end of the last token time interval calculated by said calculating means of said respective BIU; and

means for transmitting an information packet on said transmission bus in response to said token receipt signal if said respective BIU has a qualified information packet to transmit.

4,464,750

SEMICONDUCTOR MEMORY DEVICE

Takeo Tatematsu, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 11, 1981, Ser. No. 329,942
Claims priority, application Japan, Dec. 23, 1980, 55-182292
Int. Cl.³ G06F 11/00
U.S. Cl. 371—21 **8 Claims**

1. A semiconductor memory device having a write mode and a read mode, comprising:

first and second power supply terminals;

a plurality of memory blocks each comprising memory cells arranged in rows and columns;

a plurality of pairs of data buses, each pair being operatively connected to one of said memory blocks;

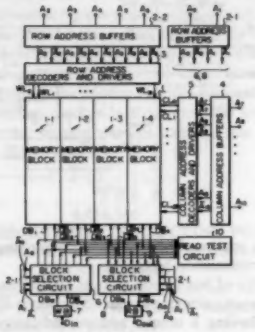
cell selection means, operatively connected to said memory blocks, for selecting one memory cell within each of said memory blocks and connecting the selected memory cells to the corresponding data buses;

write data buses;

read data buses;

a block selection circuit, operatively connected to said pairs of data buses, said read data buses and said write data

buses, for selecting one pair of said pairs of data buses during the read mode and connecting said selected pair of data buses to said read data buses, and for selecting one pair of said pairs of data buses during the write mode and connecting the selected pair of data buses to said write data buses, said block selection circuit comprising simultaneous write means for selecting all of said pairs of data buses to simultaneously write input data in all of the selected memory cells selected by said cell selection means; and



a read test circuit, operatively connected to said first and second power supply terminals and to said data buses, for detecting the potential of each of said data buses and for checking simultaneously whether or not the data on said data buses transmitted from the selected memory cells is correct.

4,464,751

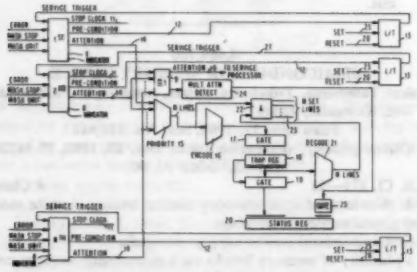
MACHINE CHECK COORDINATION

Thomas A. Stranko, and Robert L. Swann, both of Poughkeepsie, N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 10, 1981, Ser. No. 320,162

Int. Cl.³ G06F *11/30*

U.S. Cl. 371—29 **4 Claims**



1. For use in a data processor system which includes a plurality of error indicators, each error indicator associated with a functional unit of the data processing system so as to provide indications of errors which may occur in the various functional units at different times before attention can be directed to them, apparatus for presenting such indications of the errors in sequence comprising:

storage means coupled to said error indicators for the receipt and preservation of a plurality of the error indications each indication from a different one of said error indicators; and

selection means coupled to said storage means for selecting among the plurality of preserved error indications the indication of the first error to occur and identifying the error indicator which produced that indication and for identifying the preserved indications of subsequent errors and the error indicators that produced subsequent indications.

4,464,752

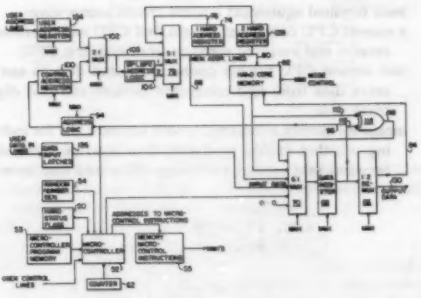
MULTIPLE EVENT HARDENED CORE MEMORY

George F. Schroeder, Wayne; Garry E. Pitt, Towaco; John F. Scully, East Orange, and Lell E. Barnes, North Caldwell, all of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Nov. 6, 1981, Ser. No. 318,726

Int. Cl.³ G06F *11/00*

U.S. Cl. 371—38 **11 Claims**



1. A circuit for reconstructing one or more words erroneously altered when nuclear events occur during cycling of a memory, the circuit comprising:

means for detecting an event and limiting data loss to one word per event;

means for setting and detecting data flags signifying occurrence of an event at a critical time of the memory cycle;

means for generating a variable time interval preceding data recovery in response to flags signifying an event;

means for performing block parity on the data in memory along at least one preselected parity block of locations in memory in response to said flags,; and

means for correcting any word in memory which was altered in response to said block parity means;

means for correcting multiple memory word upsets in response to said block parity means; and

means for updating block parity during sequential storage or random storage of data words before or after an event.

4,464,753

TWO BIT SYMBOL SEC/DED CODE

Chin L. Chen, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/US81/01767, 371 Date Dec. 30, 1981, 102(e) Date Dec. 30, 1981, PCT Pub. No. WO83/02345, PCT Pub. Date Jul. 7, 1983

PCT Filed Dec. 30, 1981, Ser. No. 349,482

Int. Cl.³ G06F *11/10*

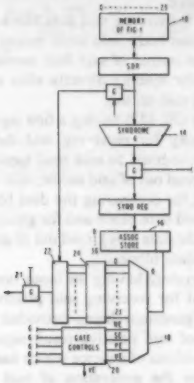
U.S. Cl. 371—38 **4 Claims**

1. In an error correction system having a single bit error correction code and double error detection code for a memory in which bits of memory data words are divided into N packages of M bits per package, modularized error correction apparatus for correcting package errors including:

encoder means for encoding data words into code words in accordance with an N bit single error correction double error detection code that was expanded to cover N pack-

ages of M bits each so that the Exclusive-OR of all M single bit error syndromes in any given package N results in a composite syndrome which is unique for each package,

decoder means including means comparing each single bit error syndrome with all possible single bit error syn-



dromes and all possible composite syndromes to determine the location of any single bit error, any single package failure and to detect all double bit errors and all double package failures; and

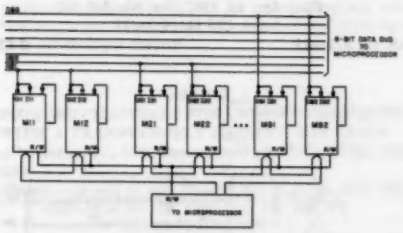
correction means for correcting errors located by said decoder means.

4,464,754

MEMORY SYSTEM WITH REDUNDANCY FOR ERROR AVOIDANCE

Roger G. Stewart, Neshanic Station, and Andrew G. F. Dingwall, Bridgewater, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 26, 1982, Ser. No. 362,462
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—51 **4 Claims**



1. A memory system comprising:

a common bus adapted to receive data signals;

N memory modules, where N is an integer greater than one, each one of said N memory modules being operated in parallel with the same information being written in their corresponding bit locations, each one of said N modules including;

(a) a random access memory (RAM) array and organized into W internal words, each word having L bits;

(b) a parity array for storing a parity bit for each internal word;

(c) means coupled to said RAM array for selectively reading a selected internal word and for concurrently reading-out onto a data output line a selected bit contained within said selected internal word;

(d) means receptive of a selected internal word and its corresponding parity bit for ascertaining whether its parity is correct and for producing a first output signal indicative thereof;

(e) selectively enabled means within each module for coupling its data output line to said common bus; and

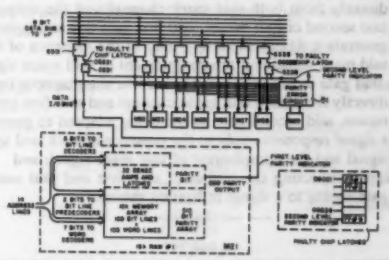
(f) control means within each module, coupled to said selectively enabled means, responsive to said first output signal for disabling said selectively enabled means and preventing the application of said selected bit to said common bus when said first output signal has a value indicative of a parity error.

4,464,755

MEMORY SYSTEM WITH ERROR DETECTION AND CORRECTION

Roger G. Stewart, Neshanic Station, and Andrew G. F. Dingwall, Bridgewater, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 26, 1982, Ser. No. 362,463
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—51 **13 Claims**



1. A memory system comprising:

M modules, each module including:

(a) a memory array of R·C memory cells partitioned internally into W internal words of L bits each and organized for external read as a memory of X words each of Y bit length, where Y is an integer equal to or greater than one, where L is greater than Y, and $R \cdot C = W \cdot L = X \cdot Y$;

(b) means for reading-out a selected one of said X words of Y bit length and for concurrently reading the internal word in which the selected X word of Y bit length is included;

(c) a parity array for storing a parity bit for each internal word; and

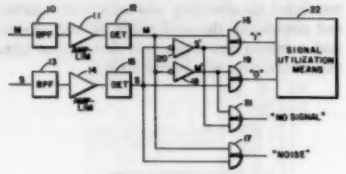
(d) means receptive of a selected internal word and its corresponding parity bit for ascertaining whether its parity is correct and for producing a first signal indicative thereof; and

means receptive of a selected X word of Y bit length from each of said M modules for ascertaining whether the parity of the selected X word of Y bit length read from the M modues is correct and for providing a second output signal indicative thereof.

4,464,756
SYSTEM FOR ERROR DETECTION IN FREQUENCY SHIFT KEYED SIGNALS

Erik T. Tromborg, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 306,278, Sep. 28, 1981, abandoned. This application Feb. 27, 1984, Ser. No. 582,869
Int. Cl.³ G06F *11/08*
U.S. Cl. 371—63 4 Claims



1. In an FSK receiver system having mark and space channels connected to a binary logic decision making system, the improvement comprising an essentially instantaneous validation system for checking the validity of any bit of a message or message unit, said validation system further comprising:

first circuit means connected to said mark channel responsive to mark signals on said mark channel and having a characteristic output which is the complement of said mark signal;

second circuit means connected to said space channel responsive to space signals on said space channel and having a characteristic output which is the complement of said space signal;

first gate means connected to receive simultaneous inputs directly from both said mark channel and the output of said second circuit means, said first gate means adapted to generate a signal responsive only to the presence of both said mark signal and the complement of said space signal;

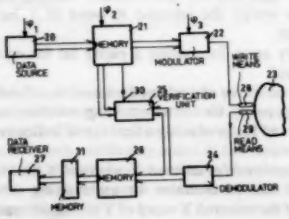
second gate means connected to receive simultaneous inputs directly from both said space channel and said first circuit means, said second gate means being adapted to generate a signal responsive only to the presence of both said space signal and the complement of said mark signal; and

means connecting the output of said first and said second gate means to a signal utilization means.

4,464,757
METHOD AND DEVICE FOR WRITING AND READING SECTOR-ORGANIZED INFORMATION INTO AND FROM A RECORD CARRIER BODY

Marinus J. B. M. Monen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,666
Claims priority, application Netherlands, Aug. 14, 1980, 8004598
Int. Cl.³ G06F *11/14*
U.S. Cl. 371—71 7 Claims



1. A device for writing and reading information in a bit-serial sequence into consecutively arranged sectors of a record carrier body, said device comprising:

a first memory (21, 102) for the temporary storage of a data block, said data block each time comprising a different part of the information to be written, an input of said first memory being connected to receive said information from an external source;

write means (28) for writing said data block into a sector of said record carrier body, said write means having an input connected to an output of said first memory;

read means (29) for reading directly after said writing the data block into said sector;

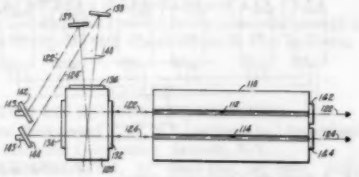
a verification unit (30, 112) having a first input connected to said first memory for receiving said data block and a second input connected to said read means for receiving the data block read out of said sector, said verification unit being provided for comparing the data block read out of said sector to said data block and for generating a positive result signal if the data block read out of said sector corresponds to said data block;

an identifier generator, having an input connected to said verification unit for receiving said positive result signal, said identifier generator being provided for generating under control of said positive result signal an identifier indicating the address of a sector which has been correctly inscribed before the generation of said positive result signal, for each positive result signal there being generated a different identifier, said identifier generator having an output connected to said first memory and said identifier generator being also provided for inserting a generated identifier into a data block to be written into a next sector.

4,464,758
PASSIVELY-Q-SWITCHED DUAL LASER

Peter P. Chenausky, Avon, Conn.; Robert J. Mongeon, East Longmeadow, Mass., and Lanny M. Laughman, Bolton, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 16, 1982, Ser. No. 369,303
Int. Cl.³ H01S *3/113*
U.S. Cl. 372—11 3 Claims



1. A passively Q-switched laser system comprising:

a first optical cavity having a first optical axis;

a second optical cavity having a second optical axis;

a passive Q-switch disposed to intersect both said first and second optical axes;

means for resonating optical radiation along said first and second axes; and

means for directing a portion of radiation resonated along one of said axes, by one of said cavities, to overlap the other of said axes in said Q-switch, thereby Q-switching said other of said cavities.

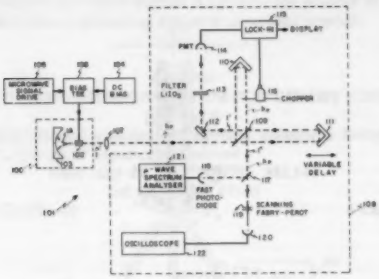
4,464,759
SEMICONDUCTOR DIODE LASER SYSTEM

Hermann A. Haus, Lexington; Lance A. Glasser, Watertown, and Ping-Tong Ho, Belmont, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 303,940, Sep. 21, 1981, which is a continuation of Ser. No. 168,329, Jul. 11, 1980, which is a continuation of Ser. No. 929,085, Jul. 31, 1978. This application Nov. 9, 1983, Ser. No. 550,064

Int. Cl.³ H01S *3/098*

U.S. Cl. 372—18 **7 Claims**



1. A compact, continuous wave, dc pumped laser system for creating pulses in the picosecond range comprising:

(a) a semiconducting laser diode comprising two sections separated by an insulating strip, at least one of said sections being an active region;

(b) bias means for independently pumping said sections thereby creating within at least one of said sections a population inversion of energy states whereby said diode emits optical radiation;

(c) external reflector means arranged to reflect said optical radiation back into said diode, an optical resonant cavity delimited by said external reflector means and an outermost cleavage plane of said diode; and

(d) microwave drive signal means combined with said dc bias means through a bias tee in order to supply a composite signal to at least one of said sections of said diode to modulate said optical radiation; thereby separating modulation from dc gain excitation, whereby the separation between said external reflector means and said diode produces a round-trip time of the reflected optical radiation that approximately equals a period of said drive signal or a sub-multiple thereof.

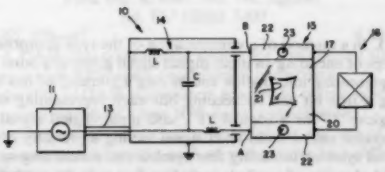
4,464,760
ELONGATED CHAMBERS FOR USE IN COMBINATION WITH A TRANSVERSELY EXCITED GAS LASER

Leroy V. Sutter, Jr., 6301 Summertime La., Culver City, Calif. 90230

Continuation-in-part of Ser. No. 370,103, Apr. 20, 1982. This application Jul. 30, 1982, Ser. No. 403,781

Int. Cl.³ H01S *3/09*

U.S. Cl. 372—38 **1 Claim**



1. An improved laser bore and electrode structure including an elongated chamber for use in combination with a gas laser which includes:

a. a laser gas disposed in said elongated chamber;

b. first and second reflecting means for reflecting light energy from said laser gas discharge within said elongated chamber so that said light energy travels longitudinally the length of said elongated chamber;

c. first and second electrode means for transversely exciting said laser gas, each of said electrode means being formed from an electrically conductive material and being disposed opposing each other;

d. energy means for applying a voltage of alternating polarity between said first and second electrode means at a frequency ranging from 10 Mhz to about 3 GHz to establish a laser gas discharge in said laser gas; and

e. coupling means comprising first impedance matching means for matching the steady state reactive impedance of said elongated chamber to the impedance of said energy means and second impedance matching means for coupling said first electrode means to said second electrode means in order to cancel the pre-ignition reactive impedance of said elongated chamber, said first impedance-matching means coupling said first and second electrode means and said second impedance-matching means to said energy means, said improved laser bore and electrode structure comprising:

an elongated chamber which is in the shape of a four pointed star and which is of cross-sectional dimensions suitable for confining a laser gas discharge, said elongated chamber being formed from a dielectric material.

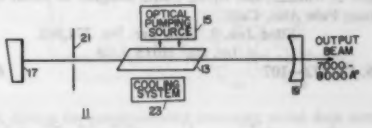
4,464,761
CHROMIUM-DOPED BERYLLIUM ALUMINUM SILICATE LASER SYSTEMS

Robert R. Alfano, 3777 Independence Ave., Bronx, N.Y. 10463, and Janusz M. Buchert, 29 Chittenden Ave., New York, N.Y. 10033

Filed Dec. 18, 1981, Ser. No. 332,258

Int. Cl.³ H01S *3/16*

U.S. Cl. 372—41 **15 Claims**



1. A laser comprising:

a. a laser medium comprising a single crystal of beryllium aluminum silicate doped with trivalent chromium ions ($Be_3Al_2Si_6O_{18}:Cr^{3+}$),

b. optical means for exciting said laser medium to emit coherent optical radiation, and

c. an optical resonant cavity for supporting coherent radiation emitted by the laser medium.

4,464,762
MONOLITHICALLY INTEGRATED DISTRIBUTED BRAGG REFLECTOR LASER

Kazuhito Furuya, Hazlet, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

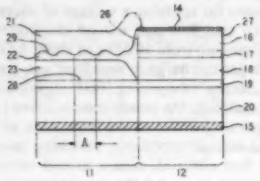
Filed Feb. 22, 1982, Ser. No. 350,879

Int. Cl.³ H01S *3/19*

U.S. Cl. 372—50 **11 Claims**

1. An optical source arrangement (FIG. 4) comprising a semiconductor substrate (19,20), a passive waveguide medium (11), a Group III–V semiconductor heterostructure (12) abutting the passive medium at a first planar surface (26) of the semiconductor heterostructure, the semiconductor heteros-

tructure having a plurality of different layers arranged for guiding optical energy through substantially a single layer (17), means (14,15) for pumping the semiconductor heterostructure, and first (27) and second (29) feedback means integrated with the semiconductor heterostructure and the passive medium, respectively, to produce sufficient feedback of optical energy to sustain optical frequency oscillations, the first feedback means including a second planar surface of the semiconductor heterostructure parallel to and opposite from the first planar



surface, the second feedback means comprising a Bragg reflector disposed substantially transverse to a propagation direction of optical energy in the passive medium, the arrangement characterized in that

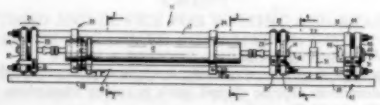
the semiconductor substrate is comprised of Group III-V semiconductor material and is monolithically integrated with the semiconductor heterostructure, and the passive medium is comprised of a dielectric silicon compound and monolithically integrated with the semiconductor heterostructure.

4,464,763

LASER OPTICAL MOUNT

Galen E. Mohler, Los Altos, Calif., assignor to Lexel Corporation, Palo Alto, Calif.

Filed Jun. 9, 1981, Ser. No. 271,965
Int. Cl.³ H01S *3/08*
U.S. Cl. 372—107 **6 Claims**



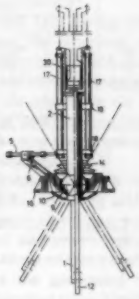
1. In a laser having resonator structure supporting at spaced apart locations a pair of mounts for respectively positioning optical reflectors in a selected, rigid and spaced-apart relationship to define an optical cavity therebetween within which a lasable medium is positionable to generate lasing action; the improvement comprising means which is an integral part of said resonator structure extending said resonator structure beyond the one of said pair of mounts provided to position a partially transmissive optical reflector at the end of the optical cavity of said laser, in a direction away from the other of said pair of mounts, which means includes a third mount outside of said optical cavity and separate from said pair of mounts for supporting outside of said optical cavity, an element responsive to the optical radiation generated by said laser, said third mount being adjustable to change the orientation of said element relative to the path of radiation emanating from said end of said optical cavity.

4,464,764

DEVICE FOR MOVING SOLID MATERIAL FED ONTO THE SURFACE OF A MELT AND FOR BREAKING A SLAG CRUST FORMED ON THE SURFACE OF THE MELT OR INSIDE THE CHARGE

Frans H. Tuovinen, Ulvila; Bengt F. Norrman, Helsinki, both of Finland; Risto M. Heikkilä, Haparanda, Sweden, and Matti E. Honkaniemi, Tornio, Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Jan. 21, 1982, Ser. No. 341,458
Int. Cl.³ F27D *23/02*
U.S. Cl. 373—87 **6 Claims**



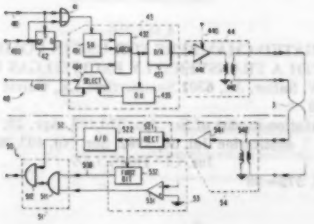
1. A device for moving solid material fed onto the surface of a melt and/or for breaking a crust formed in or on the surface of the melt in a furnace comprising a casing supporting a spindle and defining a cooling chamber surrounding said spindle, means for rotatably supporting said casing relative to the furnace, means for rotating said spindle and for tilting said casing relative to said furnace, and means for reciprocating said spindle relative to said casing to stir or break up the material fed into the melt and cool the spindle when it is not in use.

4,464,765

BURST SIGNAL TRANSMISSION SYSTEM

Hiroshi Shimizu, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1982, Ser. No. 368,235
Claims priority, application Japan, Apr. 15, 1981, 56-55531
Int. Cl.³ H04L *25/34*
U.S. Cl. 375—17 **17 Claims**



1. In a method of communication of the type comprising the steps of encoding an input digital signal given in a burst mode, representing information and having a plurality of bits including a first bit and succeeding bits each representing either a logical "0" or a logical "1", said input digital signal being encoded into a multi-level signal having a plurality of multi-level symbols including first symbol and succeeding symbols, said plurality of symbols including first polarity symbols, second polarity symbols and zero level symbols, transmitting said multi-level signal and, at a receiving end, decoding said en-

coded signal to obtain said information, the improvement characterized in that said encoding step comprises:

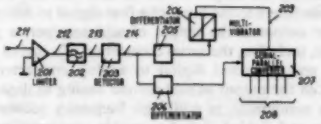
successively generating said plurality of symbols corresponding to said plurality of bits, including generating a first polarity symbol as said first symbol if said first bit represents a logical "1" and generating a second polarity symbol as said first symbol if said first bit represents a logical "0", each non-zero generated succeeding symbol having a polarity opposite the polarity of the average DC level of prior generated symbols, unless said average DC level is substantially zero in which case the polarity of a non-zero generated symbol is opposite the polarity of the most recent preceding non-zero generated symbol.

4,464,766

RADIO TRANSMISSION SYSTEM FOR BINARY CODED SIGNALS

Christian Masur, Lommiswil, Switzerland, assignor to Autophon A.G., Canton of Soleure, Switzerland

Filed May 28, 1982, Ser. No. 383,140
Int. Cl.³ H04L *27/10*
U.S. Cl. 375—49 **6 Claims**



1. A system for transmitting a binary coded signal by radio, of the type having circuit means at the transmission end for converting said binary coded signal into a signal suitable for modulation upon a radio-frequency signal, and circuit means at the receiving end for demodulating said radio-frequency signal and for supplying said demodulated signal to a limiter for producing a bipolar signal dependent upon the momentary polarity of the signal applied thereto, wherein the improvement comprises:

circuitry included in said circuit means at the transmission end for converting a binary digit of one kind supplied thereto into a single, complete sinusoidal oscillation of a first frequency and for converting a binary digit of the other kind supplied to said circuitry into a sequency consisting of an oscillation packet of a second frequence and a said single, complete oscillation of said first frequency; and

means at the receiving end for converting the output signal from said limiter into a binary signal.

4,464,767

SYSTEM FOR GENERATION OF MULTIPLE POINTED QAM SIGNAL SPACES BY USE OF SYNCHRONOUS QAM TRANSMITTERS

Gordon Bremer, Clearwater, Fla., assignor to Paradyne Corporation, Largo, Fla.

Filed Sep. 8, 1981, Ser. No. 299,663
Int. Cl.³ H03D *5/00*
U.S. Cl. 375—67 **6 Claims**

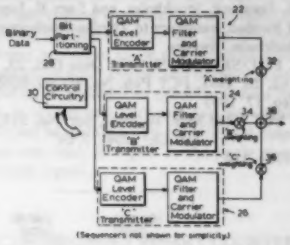
1. A QAM data transmission system for transmitting signals having a high BPS signal constellation comprising:

a plurality of QAM transmitters adapted to output synchronously signals of a low BPS signal constellation;

weighing means connected to each of the outputs of said transmitters to weight each of said outputs by a different factor;

a summer connected to the output of each of said weighing means; and

a partitioning circuit for receiving a binary data input and steering the data bits to said transmitters;



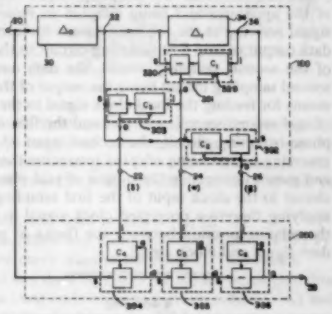
said different factors being chosen to produce said high BPS signal constellation.

4,464,768

ADAPTIVE PREPROCESSING SYSTEM

Bernard L. Lewis, Oxon Hill, and Frank F. Kretschmer, Jr., Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 28, 1975, Ser. No. 580,510
Int. Cl.³ H04B *1/12*; G01S *13/52*
U.S. Cl. 375—101 **4 Claims**



1. A device for preprocessing incoming serial data samples comprising:

means for receiving sequential incoming data samples;

a plurality of serially connected delay means coupled to said receiving means, each said delay means providing an output signal and being arranged to delay each said incoming sample such that the delayed and undelayed samples are simultaneously available;

a plurality of first means, at least one being coupled to the output and input of the last of said delay means for extracting non-correlative components of each said data sample simultaneously available and at least one being coupled to the outputs of a delay means and one of said first means to extract the correlative components of said outputs; and

a plurality of serially connected second means, the first being coupled to said incoming data sample receiving means to receive said data samples and each being coupled to a different one of said first means to receive said extracted components, said second means modifying said incoming data samples to reduce undesired signal components in said incoming data samples at the output of said second means,

each said first and second means having a feedback path which is independent of the feedback path of any of the other of said first and second means.

4,464,769

METHOD AND APPARATUS FOR SYNCHRONIZING A BINARY DATA SIGNAL

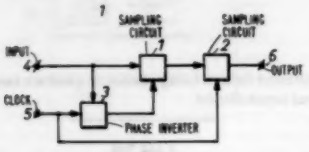
Gunnar S. Forsberg, Stockholm, and Lars P. Ingre, Huddinge, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE81/00075, 371 Date Oct. 23, 1981, 102(e) Date Oct. 23, 1981, PCT Pub. No. WO81/02654, PCT Pub. Date Sep. 17, 1981

PCT Filed Mar. 10, 1981, Ser. No. 315,528

Int. Cl.³ H04L 7/04

U.S. Cl. 375—110 **4 Claims**



1. In a receiver of binary coded data signals in the form of pulses having flanks, apparatus for synchronizing an incoming data signal(A) with a local clock signal(B) in the form of pulses having flanks available in the receiver, comprising:

(a) a first and a second sampling circuit(1,2) each provided with a data input, a data output and a clock input,

(b) a phase-reversing circuit(3) provided with a first and a second input and an output,

the data output of said first sampling circuit being the input of the apparatus and being adapted to receive the data signal arriving at the receiver, means for connecting the data output of said first sampling circuit to the data input of the second sampling circuit, the data output of said second sampling circuit being the output of the apparatus, means for feeding the local clock signal to the clock input of said second sampling circuit and the first input of said phase-reversing circuit, the second input of said phase-reversing circuit being adapted to receive the data signal, and means connecting the output of said phase-reversing circuit to the clock input of the first sampling circuit for applying thereto a corrected clock signal in response to the relative position between the flanks of pulses in the data signal and clock signal.

4,464,770

SYNCHRONOUS RADIO OR TELEVISION RECEIVER WITH ANALOG HIGH FREQUENCY SECTION FOLLOWED BY DIGITAL LOW FREQUENCY SECTION

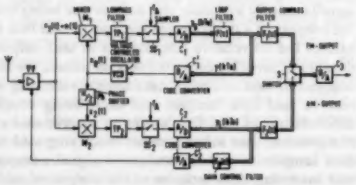
Robert Maurer, and Georg Frank, both of Saarbrücken, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 7, 1982, Ser. No. 366,393

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1981, 3114063

Int. Cl.³ H04L 27/06

U.S. Cl. 375—119 **12 Claims**



3. A synchronous radio or television receiver wherein the high frequency input signal is converted by multiplication directly into the base band using a phase locked loop and wherein the receiver has a high frequency section followed by a low frequency section with said high frequency section being realized by analog components and said low frequency section being realized by digital components; said receiver comprising: an input analog preamplifier; first and second quadrature operated multiplying analog mixers each having one input connected to the output of said preamplifier; a voltage controlled oscillator having its output connected directly to a second input of said first mixer and connected via a $\pi/2$ phase shifter to a second input of said second mixer, and having a control input; first and second analog lowpass filters for selecting out interfering mixed products connected to the outputs of said first and second mixers, respectively; first and second sampling means, connected to the outputs of said first and second analog lowpass filters, respectively, for sampling the analog output signals of said first and second lowpass filters at a given sampling frequency; first and second analog to digital converters, connected to the outputs of said first and second sampling means respectively, for converting the respective sampled analog base band signals to digital signals; a digital loop filter connected to the output of said first analog to digital converter; first and second digital output lowpass filters connected to the outputs of said digital loop filter and said second analog to digital converter, respectively; switching means for selectively connecting the output of one of said first and second output lowpass filters to the input of a first digital to analog converter whose output is the output of said receiver; a gain control circuit, including the series connection of a digital gain control filter and a second digital to analog converter, connected between the output of said second analog to digital converter and a component in said high frequency section of said receiver; and a third digital to analog converter connected between the output of said digital loop filter and said control input of said voltage controlled oscillator to complete the phase locked loop.

4,464,771

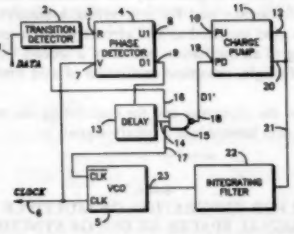
PHASE-LOCKED LOOP CIRCUIT ARRANGEMENT

Bendt H. Sorensen, Meinier, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 2, 1982, Ser. No. 364,956

Int. Cl.³ H04L 7/02

U.S. Cl. 375—120 **4 Claims**



1. A phase locked loop circuit arrangement for synchronizing an oscillator to a NRZ (Non-Return-to-Zero) data signal in which a transition from one potential level to another represents a data transition from one binary value to another; the arrangement including a controllable oscillator for providing a clock signal; a phase comparator for comparing the phases of the data and clock signals with one another; means for applying a control signal to adjust the oscillating frequency of the oscillator in dependence upon an amount by which the phase of the data leads that of the clock signal and vice-versa, the means for applying a control signal including means for inhibiting the application of a control signal to the oscillator during a cycle of the clock signal in which the phase of the clock signal leads that of the data and no data transition occurs, the phase

comparator has a first output for providing an output signal indicative of the phase of the data leading that of the clock signal and a second output for providing an output signal indicative of the phase of the clock signal leading that of the data, the means for inhibiting the application of a control signal to the oscillator includes gating means coupled to the second output of the phase comparator and arranged to be enabled by a data transition, and the gating means is coupled to the second output of the phase comparator via a delay circuit which stores an output signal fed from the phase comparator and indicative of the phase of the clock signal leading that of the data during a clock cycle and which feeds to the gating means a signal representative of the phase difference between the clock and data signals following the arrival of a data transition during that clock cycle.

4,464,772

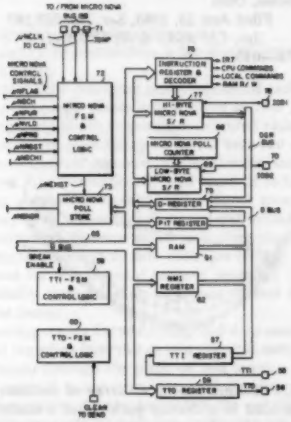
FREQUENCY SYNTHESIZER FOR PROVIDING A PSEUDO-CONSTANT FREQUENCY SIGNAL

Edward M. Buckley, Hopedale; Michael B. Druke, Chelmsford, both of Mass., and Roger W. March, Santa Clara, Calif., assignors to Data General Corporation, Westboro, Mass.

Filed Feb. 11, 1980, Ser. No. 120,291

Int. Cl.³ H03K *21/36*

U.S. Cl. 377—47 **6 Claims**



1. A frequency synthesizer for providing an output signal having the same pseudo-constant frequency with a known period in response to a selected one of a plurality of input signals each having a different fixed frequency, the frequencies of said plurality of input signals being of the same order of magnitude as, or higher than, said pseudo-constant frequency, said frequency synthesizer comprising:

decode means responsive to a coded signal representing a selected one of said plurality of input signals for providing a control signal corresponding to said selected input signal;

first means responsive to said control signal for supplying a number representing a selected number of successive sub-groups of one or more cycles of said selected input signal, the number of cycles of said input signal in each said sub-group being one of two consecutive integers identifiable as a high integer and a low integer;

counter means responsive to said selected number and to said output signal for providing a position count signal at each successive sub-group;

parsing means responsive to said position count signal and to said control signal for providing a high/low signal specifying the sub-group position at which a high integer number of input cycles are used or a low integer number of input cycles are used; and

second means responsive to said selected one of said input signals, to said control signal, and to said high/low signal for specifying said high integer and said low integer and for supplying an output cycle at each successive high or low sub-group of input cycles, said output cycles forming said output signal having said pseudo-constant frequency, the order in which said high and low sub-groups occur being selected to maintain any error in said output signal at a value less than or equal to the cycle time of said selected input signal.

4,464,773

DYNAMIC SYNCHRONOUS BINARY COUNTER WITH STAGES OF IDENTICAL DESIGN

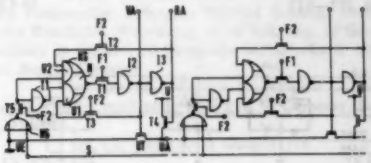
Reiner Backes, Freiburg; Friedrich Schmidtpott, Gundelfingen, and Mathew Neal, Freiburg, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed May 21, 1982, Ser. No. 380,791

Claims priority, application European Pat. Off., Jun. 12, 1981, 81-200648

Int. Cl.³ H03K *21/06, 21/34, 23/22*

U.S. Cl. 377—116 **4 Claims**



1. A dynamic synchronous binary counter having at least two ratio-type stages of identical design which are implemented with insulated-gate field-effect transistors and are operated with two clock signals (F1, F2), each of said stages comprising:

first, second, and third inverters (I1, I2, I3);

first, second, third and fourth transfer transistors (T1 to T4);

at least one carry transfer transistor (UT); wherein

the second and third inverters (I2, I3) are connected directly in series, their node being a count-up output (VA), and the output of the third inverter (I3) being a count-down output (RA);

the count-up output (VA) is coupled to the gate of the carry transfer transistor (UT);

the input of the second inverter (I2) is preceded by the current path of the first transfer transistor (T1), which is controlled by the first clock signal (F1);

the current path of the second transfer transistor (T2), which is controlled by the second clock signal (F2), is connected to the count-down output (RA);

the third transfer transistor (T3) is controlled by the second clock signal (F2);

each of said stages further comprising:

a carry input (UE) and a carry output (UA) coupled together by the current path of the carry transfer transistor (UT), the carry input (UE) of the least significant stage being connected to ground;

a NOR gate (NG) having a first input connected to the carry input (UE), and a second input connected to a stop line (S);

a complex gate (KG) comprising first and second NORed AND elements (U1, U2) and having an output coupled to the input of the second inverter (I2) through the current path of the first transfer transistor (T1), wherein

the count-up output (VA) is coupled through the current path of the third transfer transistor (T3) to a first input of

the first AND element (U1), whose second input is connected to the output of the first inverter (I1), and

the carry output (UA) is connected to a constant voltage (U) through the controlled current path of the fourth transfer transistor (T4), whose gate is connected to the count-down output (RA), and

the count-down output (RA) is coupled through the current path of the second transfer transistor (T2) to the first input of the second AND element (U2), whose second input, together with the input of the first inverter (I1), is connected to the output of the NOR gate (NG) through a fifth transfer transistor (T5), which is controlled by the second clock signal (F2), and

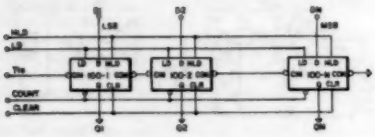
the clock signals (F1, F2) are nonoverlapping two-phase clock signals as are used in the prior art.

4,464,774

HIGH SPEED COUNTER CIRCUIT

James Jennings, Irvine, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 15, 1982, Ser. No. 358,366
Int. Cl.³ H03K *21/16, 23/02*
U.S. Cl. 377—117 **14 Claims**



1. A counter circuit comprising,

latch means for storing a count signal,

control means connected from the output of said latch means to the input of said latch means to selectively transfer signals from said output to said input of said latch means for selectively altering the state of said latch means to thereby alter the count signal stored therein, and

circuit means connected to said control means to selectively indicate the status of a carry signal in said counter circuit.

4,464,775

METHOD AND APPARATUS FOR COLLECTING X-RAY ABSORPTION DATA IN X-RAY COMPUTED TOMOGRAPHY APPARATUS

Yoshio Yamagishi, Utsunomiya, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

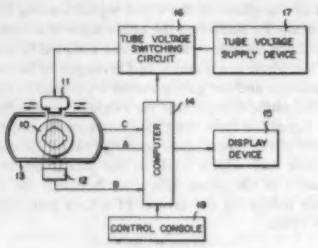
Filed Oct. 2, 1981, Ser. No. 307,876
Claims priority, application Japan, Oct. 8, 1980, 55-141016
Int. Cl.³ G03B *41/16*
U.S. Cl. 378—5 **2 Claims**

1. A method of collecting X-ray absorption data in an X-ray computed tomography apparatus, comprising the steps of:

collecting X-ray absorption data of a given plane section of a body while an X-ray tube and an X-ray detector disposed to face said X-ray tube scan said plane section in a first direction while a first voltage is applied to said X-ray tube;

collecting X-ray absorption data of said plane section while said X-ray tube and X-ray detector are moving in a second direction opposite to said first direction while a second voltage different from said first voltage is applied to said X-ray tube;

rotating said body relative to said X-ray tube and X-ray detector by a predetermined angle; and



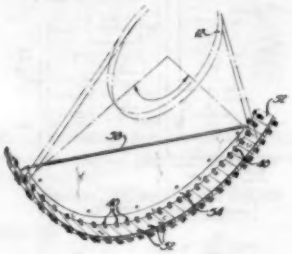
repeating said first and second collecting steps and said rotating step until said body is rotated relative to said X-ray tube and X-ray detector through at least 180°.

4,464,776

MULTIPLEXING SIGNAL PROCESSING CHANNELS IN A CT SCANNER WITH ROTATING SOURCE

Joseph W. Erker, Aurora, Ohio, assignor to Technicare Corporation, Solon, Ohio

Filed Jun. 23, 1983, Ser. No. 507,187
Int. Cl.³ A61B *6/00*; G03B *41/16*
U.S. Cl. 378—010 **10 Claims**



1. In a CT scanner having an array of stationary radiation detectors spaced in a curved path about a center point and having a concentrically rotating source of radiation emitted in a fan pattern subtending a number of the detectors, each detector producing an electronic output signal having an amplitude indicative of the intensity of radiation impinging upon that detector, the irradiated area common to different positions of the fan pattern defining a corresponding patient scan circle, a data channel multiplexing system which comprises:

(a) a number of signal collecting means corresponding to at least the maximum number of detectors subtended by the fan pattern, each such signal collecting means connected to receive the electronic output signals of a respective exclusive group of nonconsecutive detectors, one and only one of which is irradiated at any given time by the radiation fan, for passing the electronic output signal at one time of no more than one detector in each group, the output of each said collecting means defining a corresponding signal processing channel;

(b) a plurality of deactivating means each associated with a grouping of one or more detectors, for normally deactivating the output signal of each detector in said group; and

(c) means, rotatable about said patient scan circle in fixed relation with said rotating source of radiation, for temporarily interrupting the deactivation means associated with a number of groups of adjacent detectors corresponding

generally to the detectors subtended by the fan pattern to permit coupling to said signal collecting means the outputs of those adjacent detectors which at any time are subtended by said fan beam of radiation.

4,464,777

RADIOGRAPHY APPARATUS

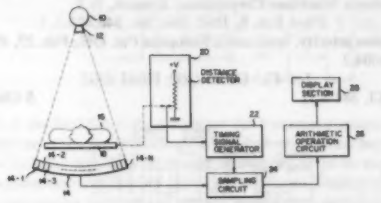
Kaoru Machida, Otawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Oct. 16, 1981, Ser. No. 311,965

Claims priority, application Japan, Oct. 22, 1980, 55-147918; Oct. 25, 1980, 55-149894; Oct. 31, 1980, 55-153214

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—146 **14 Claims**



1. A radiography apparatus comprising:

radiation means for transmitting a fan-shaped beam of radiation in a plane;

detector means for detecting said transmitted radiation at a plurality of spaced points in said plane and for producing data output signals in response to detected radiation;

support means for positioning an object between said radiation means and said detector means whereby said object is irradiated for examination by said beam of radiation;

positioning means for moving said support means toward and away from said radiation means and including means for generating a distance signal indicating the distance of said support means from said radiation means;

drive means for moving said support means in a direction substantially orthogonal to the plane of said fan-shaped radiation beam;

data collecting means for collecting said data output signals at timed sampling intervals as said object is moved by said drive means through the plane of said beam;

sampling control means receiving said distance signal and being responsive thereto to control the sampling of said data output signals by said data collecting means so that the distance moved by said object between consecutive sampling intervals is controlled as a direct function of the distance between said radiation means and said support means; and

means for forming a radiogram from data output signals collected by said data collecting means.

4,464,778

X-RAY EXAMINATION MEANS

Norbert Goldmann, Spardorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

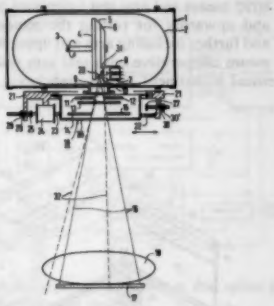
Filed Sep. 16, 1982, Ser. No. 418,777

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136806

Int. Cl.³ G21K *1/04*; H05G *1/58, 1/66*

U.S. Cl. 378—150 **10 Claims**

1. X-ray examination means comprising an X-ray tube with at least two different, selectively engageable focal points (**20, 31**), comprising a primary radiation diaphragm having diaphragm plates for defining an X-ray beam produced by the X-ray tube, and comprising an image layer, characterized in shifting means for synchronously shifting the diaphragm plates (**11, 12, 13, 14, 15, 35, 36, 37, 38, 39, 40, 41**) of the primary radiation diaphragm (**10, 33**) in the same direction and by approximately the same amount by which the focal point is



displaced when switching from the one to the other focal point.

4,464,779

X-RAY EXAMINATION DEVICE

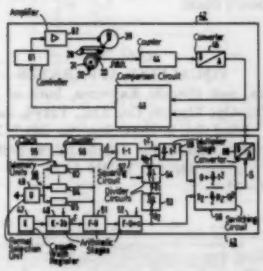
Johann Finkenzeller, Erlangen; Wilfried Schmidt, Stein, and Heinz Reinfelder, Wuerzburg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 21, 1982, Ser. No. 420,897

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138911

Int. Cl.³ A61B *6/00*; G03B *41/16*

U.S. Cl. 378—176 **16 Claims**



1. An X-ray examination device comprising an image recording device for recording synoptic X-ray exposures on an image layer, transport means comprising a drive motor for the transport of an image layer carrier from a ready position into an exposure position and back, and speed control means for the drive motor, characterized in that said speed control means provides an overall transport time of the image layer carrier (**7**) from the ready position into the exposure position which is kept constant independently of the mass to be transported.

4,464,780

PEDIATRIC RESTRAINT FOR X-RAY PHOTOGRAPHY

Gilbert G. Ruiz, 2614 N. Sterling Dr., McHenry, Ill. 60050

Filed Aug. 19, 1982, Ser. No. 409,439

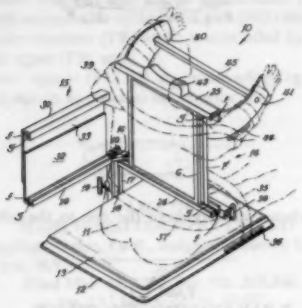
Int. Cl.³ A61B *6/04*

U.S. Cl. 378—178 **19 Claims**

18. In a pediatric restraint for immobilizing a small child in an upright seated position for chest X-ray examination, including film holding means, leg restraints and a generally planar seat, the improvement comprising:

cross framework means traversing the seat generally above the patient's thighs and having film holder means for disposing X-ray film closely adjacent the patient's chest, said cross framework including lower back restraining strap means and arm rest extensions projecting outwardly and upwardly for resting the patient's arms thereupon, and further including arm and upper back restraining strap means cooperative with said arm rests;

vertical adjustment means associating with said seat and



movably connecting the cross framework means to the seat for adjustably positioning the cross framework at variable heights above said seat;

side framework means having means for connecting to said cross framework means generally at right angles thereto along a side of the seat laterally of the patient, said side framework means being movably adjustable in response to adjustment of said vertical adjustment means, and including film holder means for disposing X-ray film laterally of the patient's chest.

4,464,781

EQUALIZER APPARATUS

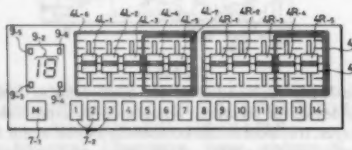
Akio Kaneko, and Hitoshi Kajiwara, both of Iwaki, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1981, Ser. No. 281,712

Claims priority, application Japan, Jul. 9, 1980, 55-92739

Int. Cl.³ H03H *5/00*

U.S. Cl. 381—12 **10 Claims**



1. An equalizer for audio equipment capable of producing two-channel sound stereophonically or simulated quadraphonically by dividing the audio signals for each channel into two frequency bands, including data means including respective control knobs for providing data signals corresponding to changes desired in the frequency characteristics of the sound reproduced by the audio equipment, control means receiving said data signals for altering the frequency characteristics of the reproduced sound according to the data signals received, and display means indicating whether the sound is being reproduced stereophonically or simulated quadraphonically and the operation of said data means, said display means including a first illuminable element of a first color for indicating operation of one channel of stereophonic sound reproduction, a second illuminable element of a second color for indicating operation of the other channel of stereophonically reproduced sound, and color coded means corresponding to said first and second colors for indicating which of said control knobs produce data signals for said first channel and which of said control knobs produce data signals for said second channel, said color coded means further serving to indicate by said first and second colors which of said control knobs produce data for each of the divided frequencies of the respective channels during operating of said audio equipment to stimulate quadraphonic sound.

4,464,782

TRANSMISSION PROCESS AND DEVICE FOR IMPLEMENTING THE SO-IMPROVED PROCESS

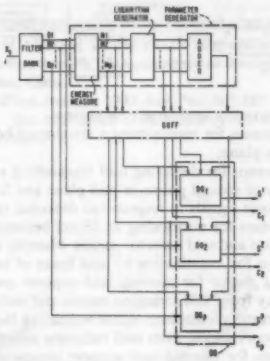
Jean-Paul Béraud, Saint Laurent du Var, and Claude Galand, Cagnes sur Mer, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,475

Claims priority, application European Pat. Off., Feb. 27, 1981, 81430004.2

Int. Cl.³ G10L *1/00*; H04J *6/02*

U.S. Cl. 381—31 **5 Claims**



1. A method of transmitting a voice signal, the spectrum of which extends within a given frequency band, said method including the following steps:

at the transmitter;

sampling said voice signal;

digitally coding the sample stream at a relatively high bit rate;

filtering the digitally-coded signal into p frequency sub-bands;

dividing the sample stream of the p sub-band filtered signals into consecutive blocks of samples of a given time duration;

sequentially requantizing each of said blocks, said requantizing including a dynamic allocation of the bits allocated to the requantizing of the samples of the voice signal of each of said sub-bands, and including for the processing of each of the blocks to be requantized, the following operations:

determining requantizing parameters of the sub-band, for each of said sub-bands, from the energy of the voice signal within said sub-band derived from the filtering and dividing operation of a given block of samples;

quasi simultaneous requantizing the samples, upon said parameter determination, which samples are contained in each sub-band and derived from said given block of samples, using the requantizing parameters determined from the previous block of samples in the same sub-bands; and,

transmitting in multiplex format the requantized signal samples over the p sub-bands together with requantizing parameters, for each block of samples.

4,464,783
SPEECH CODING METHOD AND DEVICE FOR IMPLEMENTING THE IMPROVED METHOD

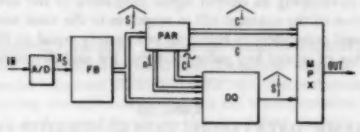
Jean-Paul Berand, Saint-Laurent-du-Var, France; Daniel J. Esteban, Raleigh, N.C., and Claude Galand, Cagnes, France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 20, 1982, Ser. No. 369,997

Claims priority, application European Pat. Off., Apr. 30, 1981, 81430011.7

Int. Cl.³ G10L *1/00*; H04B *1/66*

U.S. Cl. 381—31 **8 Claims**



1. A method for coding a signal the frequency spectrum of which covers a predetermined and relatively limited band and in which the signal to be coded is sampled so as to supply a continuum of consecutive samples, said samples being divided into successive segments of predetermined time duration, each segment thus containing a block of samples to be coded with a predetermined number of bits, said method comprising the following operations:

determining from each of said sample blocks a predetermined number of scale factors individually defined in accordance with the BCPCM type methods;

comparing each with the other said scale factors obtained from a given sample block so as to derive from said comparison a measure of the amplitude variation of the compared scale factors;

identifying each said sample block as a transient block or as non-transient block depending on whether the amplitude of variation of the scale factor of the said block falls outside or within predetermined limit values;

determining the number of scale factors to be retained for a said block depending upon its identification;

determining the number of bits required for coding said scale factor or factors of a said block based upon the number of scale factors to be retained for a said block;

determining the number of bits remaining available for quantizing the samples of a said block; and

coding said scale factor or factors and the samples of the block considered.

4,464,784
PITCH CHANGER WITH GLITCH MINIMIZER

Anthony M. Agnello, Brooklyn, N.Y., assignor to Eventide Clockworks, Inc., New York, N.Y.

Filed Apr. 30, 1981, Ser. No. 259,092

Int. Cl.³ G10L *1/00*; H04B *1/66*; G11B *5/02*

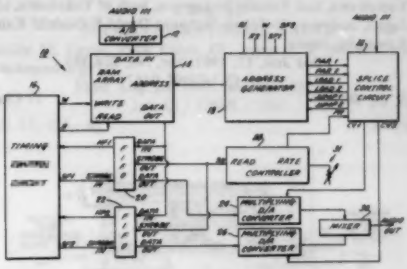
U.S. Cl. 381—61 **17 Claims**

1. A process of splicing together first and second signal segments of the same input signal, said second signal segment being longer than said first signal segment, said process comprising the steps of:

(A) comparing said first signal segment with a plurality of different subsegments of said second signal segment, each of said subsegments being equal in length to the length of said first signal segment and corresponding to a different splice point;

(B) generating a respective auto correlation coefficient as a function of each of said comparisons, each of said auto correlation coefficients being representative of the similarity between said first signal segment and a respective subsegment of said second signal segment;

(C) determining the most desirable splice point as a function of said auto correlation coefficients; and



(D) splicing said signal segments together at that splice point determined to be the most desirable.

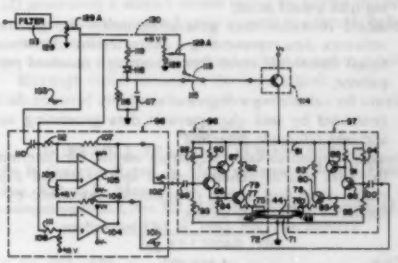
4,464,785
LOUDSPEAKER SYSTEM

William A. Kagdis, deceased, late of Baltimore, Md. (by Claude F. McKenzie, executor), assignor to Charles N. K. Cluxton, Baltimore, Md.

Filed Apr. 8, 1983, Ser. No. 482,967

Int. Cl.³ H04R *3/00*

U.S. Cl. 381—117 **11 Claims**



1. A loudspeaker system comprising, in combination, at least one electromagnetic loudspeaker assembly consisting of a single vibratory coil form to which a vibratory diaphragm is attached, at least two voice coils wound on said vibratory coil form, each operating within a magnetic field, a signal conditioning network and at least one pair of amplifiers, one for each of said voice coils, means coupling said signal conditioning network to each of said amplifiers, means coupling said amplifiers to respective ones of said voice coils, means for providing D.C. currents to said voice coils to develop magnetic forces about each of said voice coils such that these forces are caused to oppose one another, means for providing audio signal currents to said voice coils from said amplifiers in such phase relation that magnetic forces which are additive are developed about said voice coils to produce a vibratory motion of said voice coil form and said diaphragm attached thereto in response to audio signals from said amplifiers, a power supply, means connected between said power supply and said voice coils for adjusting the D.C. current levels supplied to the voice coils, and means for controlling said means connected between said power supply and said voice coils to change the level of D.C. current in said voice coils to assure that the audio signals will not be clipped.

4,464,786
SYSTEM FOR IDENTIFYING CURRENCY NOTE

Akihiro Nishito, Kawasaki; Ko Ohtombe, Tokyo; Susumu Yamakawa, and Yasushi Nakamura, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

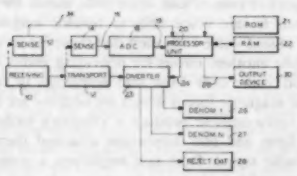
Filed Jun. 17, 1981, Ser. No. 274,383
Int. Cl.³ G06K *9/62*
U.S. Cl. 382—7 **17 Claims**

1. A printed matter identification system comprising:
means for scanning a printed pattern of said printed matter and generating a plurality of scanning signals indicative thereof;
means, coupled to said scanning and generating means, for detecting a particular one of said scanning signals having a predetermined characteristic from among said plurality of scanning signals;
means, coupled to said detecting means for determining a fixed portion of said printed pattern corresponding to said detected scanning signal; means, coupled to said determining means, for generating characteristic data corresponding to said fixed portion of said printed pattern and defining it as a start point;
standard reference data generating means for generating reference data representing a characteristic of a scanning signal that would result from scanning a standard printed pattern;
means for calculating a degree of similarity between the data generated by said characteristic data generating means and said reference data; and
means, coupled to said calculating means, for determining the kind and/or genuineness of said examined printed matter from said degree of similarity calculated by said similarity calculating means.

4,464,787
APPARATUS AND METHOD FOR CURRENCY VALIDATION

Leonard A. Fish, Chicago, and Thomas Hanger, Melrose Park, both of Ill., assignors to Casino Technology, Schiller Park, Ill.

Filed Jun. 23, 1981, Ser. No. 276,684
Int. Cl.³ G06K *9/62*
U.S. Cl. 382—7 **19 Claims**

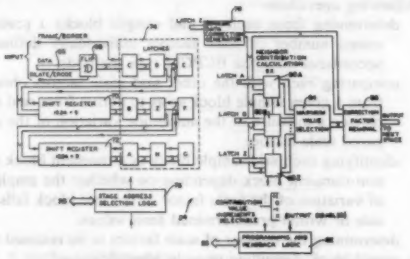


1. A method of detecting and designating the denomination of paper currency being scanned longitudinally by a magnetic read head, comprising the steps of:
(a) digitizing an analog signal developed by said read head for producing digital words indicative of said analog signal,
(b) processing said words for developing data relative to the position of pulses represented by said analog signal,
(c) modifying said position data in response to the relative length of one area of the bill being scanned relative to a standard length for said area,
(d) comparing the modified positions with stored data representing normal locations for key pulses which are expected during scanning of a bill of one of a plurality of denominations,
(e) counting the number of coincidences of scanned pulses relative to stored key pulse locations, and
(f) developing an output signal indicative of the denomination of the scanned bill in response to the total number of said coincidences being approximately equal to the number of stored key pulse locations for said denomination.

4,464,788
DYNAMIC DATA CORRECTION GENERATOR FOR AN IMAGE ANALYZER SYSTEM

Stanley R. Sternberg; Robert M. Lougheed, and William O. Dargel, all of Ann Arbor, Mich., assignors to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Continuation of Ser. No. 73,816, Sep. 10, 1979, Pat. No. 4,290,049. This application Sep. 8, 1981, Ser. No. 300,328
Int. Cl.³ G06K *9/00;* **G06F** *15/20*
U.S. Cl. 382—41 **7 Claims**



1. Apparatus for analyzing digital data signals having various values representing characteristics of points in a first matrix, said apparatus comprising:
digital logic circuitry means for performing essentially a one-to-one transformation of substantially all of the points in the first matrix into a second matrix having a corresponding number of points, with the transformation of each point being carried out by:
means for sensing the value of a data signal associated with a given point in the first matrix;
means for adjusting the values of data signals associated with a plurality of selected points in the first matrix as a function of the sensed value of the given point; and
means for generating a new digital value for the given point depending upon the relationship between the adjusted values of the selected data signals whereby substantially all of the points in the first matrix are transformed in like manner to generate a second matrix.

4,464,789
IMAGE ANALYZER FOR PROCESSING MULTIPLE FRAMES OF IMAGE DATA

Stanley R. Sternberg, Ann Arbor, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

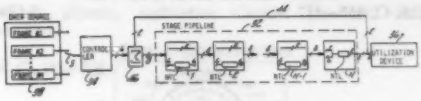
Division of Ser. No. 150,833, May 19, 1980, Pat. No. 4,369,430. This application May 14, 1982, Ser. No. 378,358
Int. Cl.³ G06K *9/56*
U.S. Cl. 382—48 **7 Claims**

1. A method of analyzing multiple image frames, each frame

being represented by a matrix of pixels fed serially from a source for processing, said method comprising:

transforming a first frame of pixels in at least one serial neighborhood transformation stage to detect spatial locations associated with a given object therein;

retaining indicia of the transformation of the first frame associated with the spatial locations of said object;



subsequently transforming a second frame of pixels in at least one serial neighborhood transformation stage to detect spatial locations associated with said object therein; and

analyzing the difference between the transformation of the first and second frames to thereby detect changes of said object between frames.

4,464,790

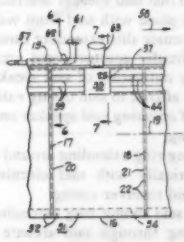
BAG WITH CLOSED VALVE

Bernard F. Blankenship, Bay Village, Ohio, assignor to Basic Packaging Systems, Inc., Avon Lake, Ohio

Filed Jun. 14, 1982, Ser. No. 388,467

Int. Cl.³ B65D *30/24*

U.S. Cl. 383—37 **20 Claims**



1. An interconnected series of valve bags comprising, in combination, a first wall and a second wall connected together near all edges to form a substantially closed bag;

said first wall being formed from first and second panels partially overlapping each other;

at least one panel seal sealing between said first and second panels at the overlapping areas thereof with said panel seal terminating near a first valve side line transverse to a first edge of said bag;

a second valve side line spaced from said first line and transverse to said first edge and including a seal between said first and second panels at the overlapping areas thereof;

a valve being defined between said two valve side lines and the unsealed portions therebetween of said overlapping first and second panels;

said valve having an interior end defined by a portion of said first panel and having an exterior end defined by a portion of said second panel, the overlapping of said first and second panels defining a self-closing valve after opening thereof and filling the bag with the desired contents, said exterior end of said valve being sealed closed and slittable for opening for filling of the bag;

interconnecting means at least near said first edge connecting each bag to an adjacent bag to form an interconnected series of bags;

means on said interconnected series of bags for alignment of said series of bags for guidance of the series of bags along a reference line of a bag filling machine; and

said alignment means being substantially parallel to said first edge.

4,464,791

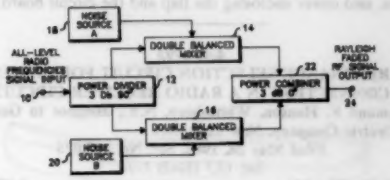
ALL-LEVEL RAYLEIGH FADER

Orville M. Eness, Park Ridge, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 23, 1982, Ser. No. 410,222

Int. Cl.³ H04B *17/00*

U.S. Cl. 455—67 **9 Claims**


NOISE SOURCE A
DOUBLE BALANCED MIXER
ALL-LEVEL RADIO FREQUENCIES SIGNAL INPUT
POWER DIVIDER 3 DB 90°
POWER COMBINER 3 dB 0°
RAYLEIGH FADED RF SIGNAL OUTPUT
DOUBLE BALANCED MIXER
NOISE SOURCE B

7. A method for Rayleigh fading an input signal comprising the steps of:

(a) dividing the input signal into a first signal and a second signal separated in phase by 90° from the first signal;

(b) generating first and second noise currents by generating respectively first and second noise voltages, and converting the first and second noise voltages into first and noise currents, respectively;

(c) generating a first output signal by mixing the first signal with the first noise current in a double balanced mixer;

(d) generating a second output signal by mixing the second signal with the second noise current in a double balanced mixer; and

(e) summing the first and second output signal to produce a Rayleigh faded version of the input signal.

4,464,792

PORTABLE TRANSMITTER ENCLOSURE

John R. Owerko, Raton, N. Mex., assignor to A.R.F. Products, Inc., Raton, N. Mex.

Continuation of Ser. No. 302,955, Sep. 16, 1981, abandoned. This application Oct. 4, 1983, Ser. No. 538,912

Int. Cl.³ H04B *1/03*

U.S. Cl. 455—128 **6 Claims**

1. A transmitter adapted for use at a remote location in a security system comprising an integral molded base having a flat plate with a first side and a second side opposite the first side, the plate being adapted to be mounted on a flat surface with the first side of the plate confronting the surface, said base being provided with a flap extending from the plate on the second side of the plate and having a portion extending parallel to the plate, the edge of the flap opposite the plate being spaced

from the plate to form an opening, the plate having an opening confronting the flap, said opening being coextensive with the portion of the flap confronting the base, a subassembly including a flat circuit board having electrical components mounted thereon including frequency determining elements, means for mounting the circuit board on said plate confronting the second side of the plate and the opening in the plate, said circuit board extending through the opening formed by said flap between the flap and the plate and the frequency determining elements of subassembly being disposed between the opening in the plate and the flap, and a cup shaped cover removably mounted on the base and extending from the second side of the plate, said cover enclosing the flap and the circuit board.

4,464,793

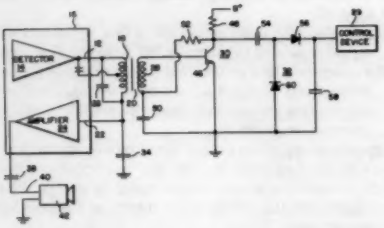
RESONANCE SELECTION CIRCUIT FOR SERIES CONNECTION IN A RADIO RECEIVER CIRCUIT

Raymond F. Hanson, Whitesboro, N.Y., assignor to General Electric Company, New York, N.Y.

Filed May 28, 1982, Ser. No. 383,075

Int. Cl.³ H04B 1/16

U.S. Cl. 455—154 **6 Claims**



1. A selection circuit adapted for connection in a superheterodyne radio receiver circuit, being responsive to the tuning state of said receiver, and for producing a signal indicative of the tuning state of said receiver, said radio receiver circuit including tuning, detector and audio output stages, said selection circuit comprising:

a transformer including a primary coil having a pair of legs said primary coil of said transformer being adapted for series connection between said detector stage and said audio output stage,

a capacitor connected in parallel with said primary coil establishing a resonance frequency range and for causing resonance between said primary coil and said capacitor when a signal within the resonance range is applied to the primary coil,

said transformer further including a secondary coil having a pair of legs and being associated with said primary coil and for producing a signal on at least one of said legs characteristic of said primary coil resonance.

4,464,794

INDICATOR DEVICE

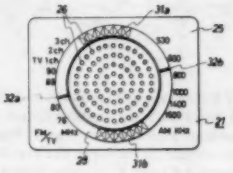
Kazuo Nakasho, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 261,510, May 7, 1981, abandoned. This application Sep. 7, 1983, Ser. No. 529,981

Claims priority, application Japan, May 9, 1980, 55-63336[U]; May 9, 1980, 55-63337[U]

Int. Cl.³ H04B 1/16

U.S. Cl. 455—157 **5 Claims**



1. A speaker mount and tuning assembly for an electrical receiver including a receiver casing having a front wall, a generally circular speaker built into said receiver casing and electrical tuning means in said receiver casing adapted to be actuated for tuning said receiver, said assembly comprising:

means defining a generally circular aperture in said front wall of said casing extending around said speaker concentrically therewith having said speaker mounted therein, said circular aperture and said speaker being structrually configured so that said speaker is arranged to be generally in a common plane with said front wall;

a plurality of arcuate slits extending through said front wall about said circular aperture, said arcuate slits being located radially outwardly of said speaker;

a speaker panel affixed to said casing extending with at least a part thereof covering said speaker on the exterior of said receiver casing;

a rotatable tuning ring extending around said speaker generally concentrically with said circular aperture on the exterior of said receiver casing;

projections on said tuning ring extending inwardly of said receiver casing through said arcuate slits for mounting said tuning ring in rotative operation relation on said receiver casing;

a rotation transfer mechanism operatively interconnecting said tuning ring and said tuning means to transmit rotative motion of said tuning ring to said tuning means for tuning said receiver; and

tuning indicia means on said tuning ring and complementary tuning indicia means affixed relative to said casing, said tuning indicia means and said complementary tuning indicia means being arranged to be adjustably positioned relative to each other for providing an indication of the frequency to which said receiver is tuned.

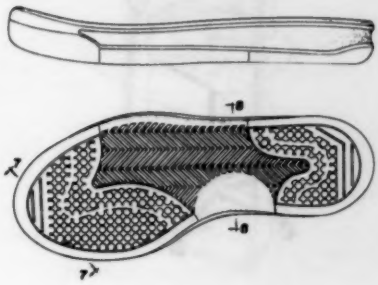
DESIGNS

AUGUST 7, 1984

274,954
SKATE BOOT
Rene Bourque, Duvernay, Canada, assignor to Warrington Inc., Montreal, Canada
Filed Mar. 19, 1982, Ser. No. 359,845
Claims priority, application Canada, Jan. 29, 1982, 29-01-82-11
Term of patent 14 years
U.S. Cl. D2—275

274,955
ATHLETIC SHOE
J. Ryoung Lee, Pusan, Rep. of Korea, assignor to E.S. Originals Inc., New York, N.Y.
Filed Jun. 17, 1982, Ser. No. 389,476
Claims priority, application Rep. of Korea, May 13, 1982, 4156/82
Term of patent 14 years
U.S. Cl. D2—309

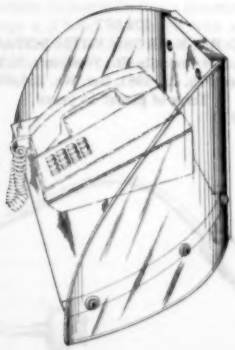
274,956
SHOE SOLE
Katumitu Saruwatari, Kurume, Japan, assignor to Nippon Rubber Co., Ltd., Tokyo, Japan
Filed Jun. 24, 1982, Ser. No. 391,696
Claims priority, application Japan, Dec. 25, 1981, 56-59218
Term of patent 14 years
U.S. Cl. D2—320



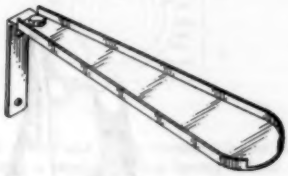
274,957
HAND HELD BACK BRUSH WITH ROTARY HEADS
Antonia Gomez, 729 Franklin St., Westbury, N.Y. 11590
Filed Feb. 23, 1981, Ser. No. 236,699
Term of patent 14 years
U.S. Cl. D4—19

274,958
STOOL
Robert Aronowitz, 40 E. 84th St., New York, N.Y. 10028, and Bernard Katzanek, 100 Caton Ave., Brooklyn, N.Y. 11218
Filed Jan. 25, 1982, Ser. No. 342,575
The portion of the term of this patent subsequent to Jul. 3, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—360

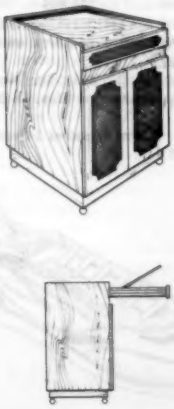
274,959
PHONE ENCLOSURE
Donald E. Glembocki, Kenilworth, and Lajos Novak, Rivervale, both of N.J., assignors to AT&T Technologies, Inc., New York, N.Y.
Filed May 14, 1982, Ser. No. 378,141
Term of patent 14 years
U.S. Cl. D6—555



274,960
CANTILEVER SHELF
Nadia N. Bohlman, 14 Yon Rd., and Georgeann C. Dau, 15 E. Shore Rd., both of Huntington, N.Y. 11743
Filed May 20, 1982, Ser. No. 380,210
Term of patent 14 years
U.S. Cl. D6—574

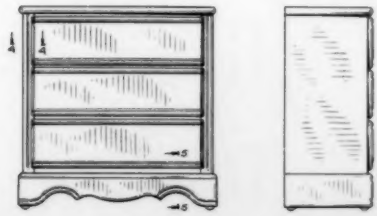


274,961
CABINET
Jerry J. Noonchester, 10841 Westpointe, Taylor, Mich. 48180
Filed Jul. 20, 1981, Ser. No. 284,625
Term of patent 14 years
U.S. Cl. D6—440

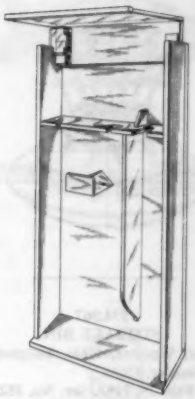


274,962
CABINET
Jerry J. Noonchester, 10841 Westpointe, Taylor, Mich. 48180
Filed Jul. 20, 1981, Ser. No. 284,627
Term of patent 14 years
U.S. Cl. D6—436

274,963
CHEST OF DRAWERS
Merlin A. Brunner, New London; Harvey J. Draheim, Weyauwega, and Michael J. Schaffer, New London, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.
Filed Nov. 9, 1981, Ser. No. 319,503
The portion of the term of this patent subsequent to Jan. 17, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—446

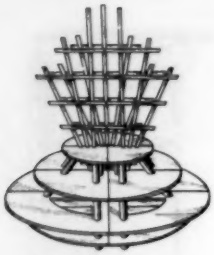


274,964
ENDOSCOPIC INSTRUMENT CABINET
Michael C. Gioia, 128 Gordon St., Ridgefield Park, N.J. 07660
Filed May 10, 1982, Ser. No. 376,779
Term of patent 14 years
U.S. Cl. D6—466



274,965
TABLE
Robert K. Thorpe, Laguna Beach, Calif., assignor to Brown Jordan Company, El Monte, Calif.
Filed Mar. 29, 1982, Ser. No. 362,965
Term of patent 14 years
U.S. Cl. D6—484

274,966
MODULAR FLOWER STAND AND TRELLIS COMBINATION
Matti Pahlanen, Borrsvängsgatan 9, Gothenburg, Sweden 412 61
Filed Dec. 8, 1981, Ser. No. 328,731
Claims priority, application Sweden, Jun. 11, 1981, 81-1348
Term of patent 14 years
U.S. Cl. D6—405



274,967
STORAGE BIN
William D. Taylor, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Feb. 25, 1982, Ser. No. 352,341
Term of patent 14 years
U.S. Cl. D6—510

274,968
FRAME FOR A CHILD'S AUTOMOBILE SEAT
Ingvar L. Lindström, Övernora 6641, 77603 Dala-Husby; Kerstin M. Hagland; Ulf M. Hanses, both of Borganäsv. 20, 78131 Borlänge, and Erik V. Lindgren, PostlÅda 1101, 79015 Sundborn, all of Sweden
Filed Dec. 22, 1981, Ser. No. 333,264
Term of patent 14 years
U.S. Cl. D6—333

274,969
CUP OR SIMILAR ARTICLE
Steve A. Unger, Manlius, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed May 17, 1982, Ser. No. 379,174
Term of patent 14 years
U.S. Cl. D7—9

274,970

BOWL OR SIMILAR ARTICLE

Philippe J. Durand, Les Daneaux, Chemin de la Garenne, 62510 Arques, France

Filed Jun. 23, 1982, Ser. No. 391,285

Claims priority, application Hague, May 24, 1982, DM/001 481

Term of patent 14 years

U.S. Cl. D7—28

274,971

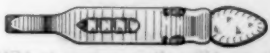
MEDICINE DISPENSER OR SIMILAR ARTICLE

Kenneth Kelley, Rte. 1, Box 88, Cave City, Ark. 72521, and Seth R. Willets, 1965 Sun Valley Dr., Batesville, Ark. 72501

Filed Mar. 22, 1982, Ser. No. 360,590

Term of patent 14 years

U.S. Cl. D7—144



274,972

CHILD'S LIGHT SWITCH EXTENSION

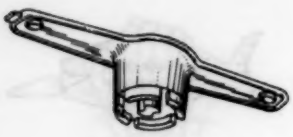
Billy F. Mann, Jr., 5460 Covent Way, Lithonia, Ga. 30058

Filed Aug. 18, 1980, Ser. No. 179,276

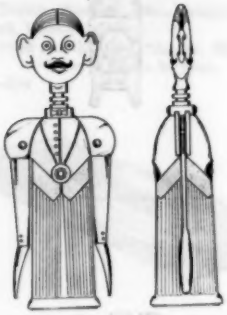
Term of patent 14 years

U.S. Cl. D8—14

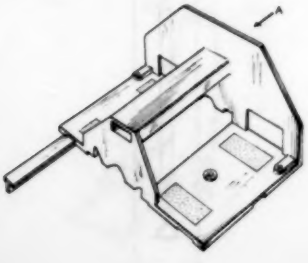
274,973
WRENCH
Adrian D. Waller, 173 Research Rd., Warrandyte, Victoria, 3113, Australia
Filed Jun. 22, 1982, Ser. No. 391,057
Claims priority, application Australia, Dec. 23, 1981, 86130
Term of patent 14 years
U.S. Cl. D8—21



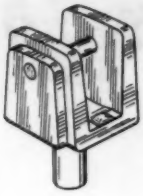
274,974
CORKSCREW
Aldo Colombo, Milan, Italy, assignor to AGHIFUG S.a.S. di Bonomi Giacomo Marino and C., Italy
Filed Mar. 26, 1982, Ser. No. 362,128
Claims priority, application Italy, Feb. 25, 1982, 6936/82[U]
Term of patent 14 years
U.S. Cl. D8—38



274,975
HAND SAW GUIDE
Cornelis J. M. Beerens, 40-42 Berkshire Rd., North Sunshine, Victoria, Australia
Filed Feb. 5, 1981, Ser. No. 231,945
Term of patent 14 years
U.S. Cl. D8—71



274,976
HANDLE POST FOR LUGGAGE OR THE LIKE
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to CPG Products Corp., Minneapolis, Minn.
Filed Mar. 3, 1982, Ser. No. 354,277
Term of patent 14 years
U.S. Cl. D8—321



274,977
BICYCLE LOCK
J. Douglass Devine, 31129 Via Colinas, Ste. 704, Westlake Village, Calif. 91362
Filed Feb. 8, 1982, Ser. No. 346,575
Term of patent 14 years
U.S. Cl. D8—331

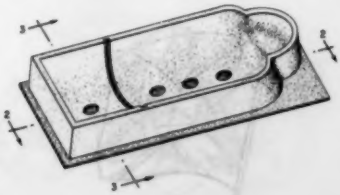
274,978
MOTORCYCLE CASE GUARD LIGHT BRACKET
James M. Preisler, Mound, Minn., assignor to Drag Specialties, Inc., Minnetonka, Minn.
Filed Dec. 20, 1982, Ser. No. 450,981
Term of patent 14 years
U.S. Cl. D8—349

274,979
WING NUT
Royce W. Hill, P.O. Box 355, Flippin, Ark. 72634
Filed Feb. 22, 1982, Ser. No. 351,273
Term of patent 14 years
U.S. Cl. D8—398

274,980
MAGNETIC DOOR HOLDER
Rioe Tomita, 47-126 Kaimalolo Pl., Kaneohe, Hi. 96744
Filed Mar. 9, 1981, Ser. No. 241,598
Term of patent 14 years
U.S. Cl. D8—402

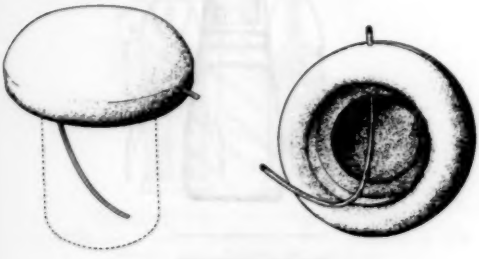
274,981
COMBINED BOTTLE, CAP AND MEASURING CUP
Earl Hoyt, Franklin Lakes, N.J., assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed May 6, 1982, Ser. No. 375,615
Term of patent 14 years
U.S. Cl. D9—337

274,982
COMPRESSED AIR OR GAS CYLINDER CRADLE
Richard S. Hunter, Christchurch, New Zealand, assignor to Novaprint, New Zealand
Filed Sep. 14, 1981, Ser. No. 301,593
Claims priority, application New Zealand, Mar. 13, 1981, 16995
Term of patent 14 years
U.S. Cl. D9—424



274,983
LID FOR A CONTAINER
William A. Dart, and Kenneth B. Dart, both of Okemos, Mich., assignors to Dart Container Corporation, Mason, Mich.
Filed Nov. 4, 1981, Ser. No. 317,790
Term of patent 14 years
U.S. Cl. D9—447

274,984
BEVERAGE DISPENSER
Ernest L. Thornell, Booneville, Ark., assignor to Spang Industries Inc., Butler, Pa.
Filed Feb. 26, 1982, Ser. No. 352,591
Term of patent 14 years
U.S. Cl. D9—448



274,985
DIGITAL CLOCK
Bernard Mermelstein, c/o M. Z. Berger & Co., Inc., 20 W. 37th St., New York, N.Y. 10018
Filed Mar. 15, 1982, Ser. No. 358,428
Term of patent 14 years
U.S. Cl. D10—6

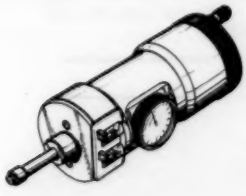
274,986
DIGITAL CLOCK
Bernard Mermelstein, c/o M. Z. Berger & Co., Inc., 20 W. 37th St., New York, N.Y. 10018
Filed Mar. 15, 1982, Ser. No. 358,430
Term of patent 14 years
U.S. Cl. D10—6

274,987
DIGITAL CLOCK
Bernard Mermelstein, c/o M. Z. Berger & Co., Inc. 20 W. 37th St., New York, N.Y. 10018
Filed Mar. 15, 1982, Ser. No. 358,427
Term of patent 14 years
U.S. Cl. D10—8

274,988
DIGITAL CLOCK
Bernard Mermelstein, c/o M. Z. Berger & Co., Inc. 20 W. 37th St., New York, N.Y. 10018
Filed Mar. 15, 1982, Ser. No. 358,456
Term of patent 14 years
U.S. Cl. D10—8

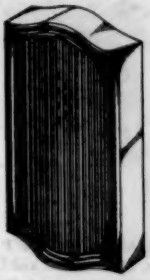
274,989
DIGITAL CLOCK
Bernard Mermelstein, c/o M. Z. Berger & Co., Inc., 20 W. 37th St., New York, N.Y. 10018
Filed Mar. 15, 1982, Ser. No. 358,426
Term of patent 14 years
U.S. Cl. D10—9

274,990
MICROMETER
Fumio Yamamoto, and Tetsuya Nakadoi, both of Kure, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan
Filed Apr. 12, 1982, Ser. No. 367,711
Claims priority, application Japan, Oct. 15, 1981, 56-45848
Term of patent 14 years
U.S. Cl. D10—73



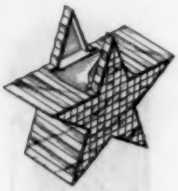
274,991
ELECTRONIC SCALE
Peter Wirtz, Vaduz, Liechtenstein, assignor to Pilux AG, Switzerland
Filed Mar. 15, 1982, Ser. No. 357,871
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1981, 8129802[U]
Term of patent 14 years
U.S. Cl. D10—92

274,992
SELECTABLE TUNE DOOR CHIME
Monte L. Levin, New York, N.Y., assignor to Square D Company, Palatine, Ill.
Filed Oct. 16, 1981, Ser. No. 312,059
Term of patent 14 years
U.S. Cl. D10—118

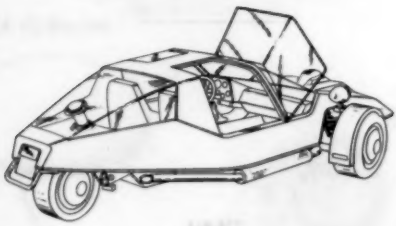


274,993
TABLE ORNAMENT
Julie Becker, Falls Rd., Shelburne, Vt. 05482
Filed Sep. 30, 1982, Ser. No. 429,870
Term of patent 14 years
U.S. Cl. D11—131

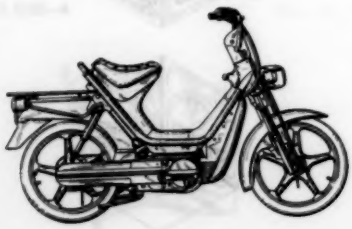
274,994
MIRRORED VASE
Lynda R. Resnick, Beverly Hills, Calif., assignor to Teleflora Inc., Los Angeles, Calif.
Filed Oct. 18, 1982, Ser. No. 434,840
Term of patent 14 years
U.S. Cl. D11—149



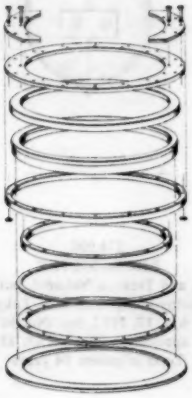
274,995
THREE WHEEL AUTOMOTIVE PASSENGER VEHICLE
Louis R. Richards, Mokena, Ill., and David J. Stollery, Laguna Beach, Calif., assignors to Trihawk, Inc., Mokena, Ill.
Filed Apr. 13, 1982, Ser. No. 367,900
Term of patent 14 years
U.S. Cl. D12—85



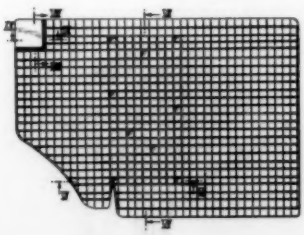
274,996
MOTORCYCLE
Bernard Lacroix, Montbeliard, and Daniel Coulon, Seloncourt, both of France, assignors to Cycles Peugeot, France
Filed Nov. 19, 1981, Ser. No. 323,020
Claims priority, application France, May 22, 1981, 811873
Term of patent 14 years
U.S. Cl. D12—110



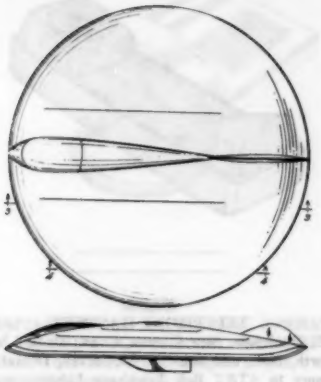
274,997
ROTARY BOLSTER FOR TRUCK OR TRAILER
Louis A. Wilson, 3340 Inverness St., Redding, Calif. 96002
Filed Jan. 18, 1982, Ser. No. 340,163
Term of patent 14 years
U.S. Cl. D12—159



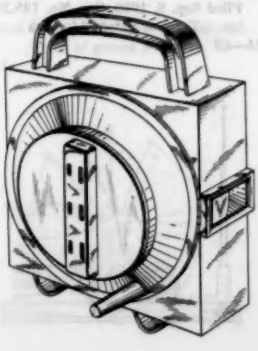
274,998
MAT FOR AN AUTOMOBILE
Jan Johansson, Halmstad, Sweden, assignor to Aktiebolaget Halmstads Gummifabrik, Sweden
Filed Oct. 8, 1981, Ser. No. 309,682
Claims priority, application Finland, Jun. 22, 1981, 472/81
Term of patent 14 years
U.S. Cl. D12—203



274,999
CIRCULAR WING AIRCRAFT
Leo P. Reeves, 6239 SE. Fern St., Portland, Oreg. 97206
Filed Mar. 1, 1982, Ser. No. 353,405
Term of patent 14 years
U.S. Cl. D12—325

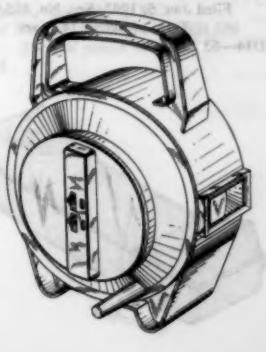


275,000
PORTABLE RETRACTABLE CORD STORAGE SYSTEM
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed Sep. 30, 1982, Ser. No. 430,920
Term of patent 14 years
U.S. Cl. D13—30

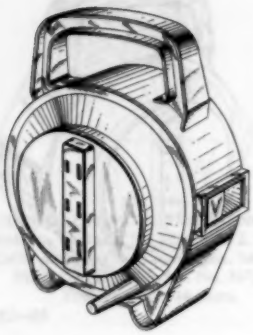


275,001
PORTABLE RETRACTABLE CORD STORAGE SYSTEM
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed Sep. 30, 1982, Ser. No. 430,894
Term of patent 14 years
U.S. Cl. D13—30

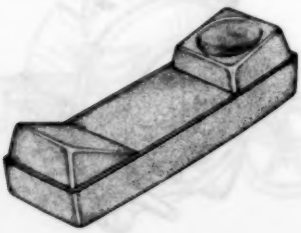
275,002
PORTABLE RETRACTABLE CORD STORAGE SYSTEM
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed Sep. 30, 1982, Ser. No. 431,964
Term of patent 14 years
U.S. Cl. D13—30



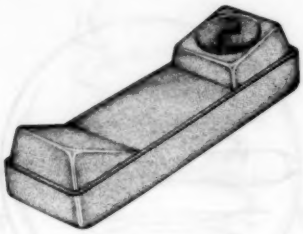
275,003
PORTABLE RETRACTABLE CORD STORAGE SYSTEM
Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.
Filed Sep. 30, 1982, Ser. No. 431,967
Term of patent 14 years
U.S. Cl. D13—30



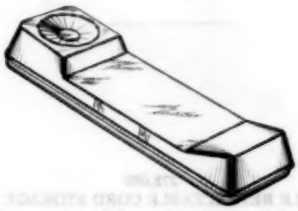
275,004
TELEPHONE HANDSET
Donald M. Genaro, Haworth, N.J.; John N. McGarvey, Drexel Hill, Pa., and Alvin R. Tilley, Red Bank, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jan. 5, 1983, Ser. No. 455,911
Term of patent 14 years
U.S. Cl. D14—63



275,005
TELEPHONE HANDSET
Donald M. Genaro, Haworth, N.J.; John N. McGarvey, Drexel Hill, Pa., and Alvin R. Tilley, Red Bank, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Jan. 5, 1983, Ser. No. 455,914
The portion of the term of this patent subsequent to Aug. 7, 1998, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—63



275,006
TELEPHONE HANDSET
David C. Danielson, New Canaan, Conn.; Donald M. Genaro, Haworth, N.J., and John N. McGarvey, Drexel Hill, Pa., assignors to AT&T Bell Telephone Laboratories, Murray Hill, N.J.
Filed Jan. 5, 1983, Ser. No. 455,915
Term of patent 14 years
U.S. Cl. D14—63



275,007
RADIO
Lee O. Silverman, 221 Thornberry Dr., Pittsburgh, Pa. 15235
Filed Sep. 8, 1980, Ser. No. 185,262
Term of patent 14 years
U.S. Cl. D14—69

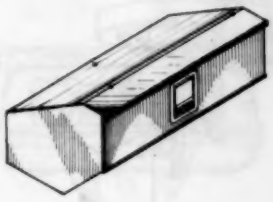
275,008
TELEPHONE
Honoré Martin, Ayze, France, assignor to Horlogerie Photographique Francaise, Bonneville, France
Filed Nov. 19, 1981, Ser. No. 322,854
Claims priority, application World Intel. Prop. Org., May 22, 1981, DMA/00076
Term of patent 14 years
U.S. Cl. D14—53

275,009
KEYBOARD-EQUIPPED ARITHMETIC OPERATION CONTROL MACHINE FOR ELECTRONIC COMPUTERS
Mikio Shibata, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan
Filed Mar. 15, 1982, Ser. No. 357,857
Claims priority, application Japan, Sep. 19, 1981, 56-41250
Term of patent 14 years
U.S. Cl. D14—100

275,010
SAIL POWERED WINDMILL
Richard K. McLean, 16 Helena St., Suite B, Santa Barbara, Calif. 93101
Filed Jun. 1, 1981, Ser. No. 268,880
Term of patent 14 years
U.S. Cl. D15—1

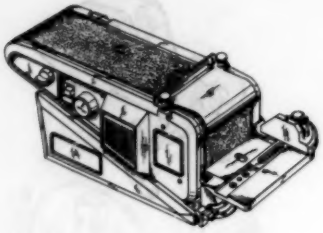
275,011
TOOL CARRIER FOR EXCAVATORS
Torsten Larsson, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden
Filed Apr. 13, 1982, Ser. No. 368,062
Claims priority, application Sweden, Oct. 20, 1981, 81-2366
Term of patent 14 years
U.S. Cl. D15—28

275,012
TRACTOR TOOL BOX
Gerald L. Sonnek, R.R., P.O. Box 21, Easton, Minn. 56025
Filed Dec. 9, 1982, Ser. No. 448,390
Term of patent 14 years
U.S. Cl. D15—28



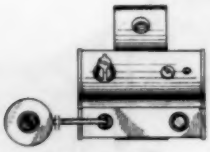
275,013
YARN GUIDE
William H. Ballinger, Pickens, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Filed Dec. 17, 1981, Ser. No. 331,556
Term of patent 14 years
U.S. Cl. D15—78

275,014
BENCH SANDER
Max K. Haenel; Edward A. Irelan, and John G. Legler, all of Columbia, Mo., assignors to Benchmark Tool Company, Jefferson City, Mo.
Filed Jan. 29, 1982, Ser. No. 344,115
Term of patent 14 years
U.S. Cl. D15—124

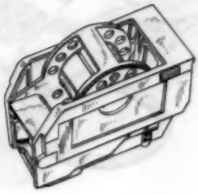


275,015
PROTECTIVE HOOD FOR A CIRCULAR SAW
Cornelis A. M. von der Wouw, Tilburg, Netherlands, assignor to Machinefabriek Bewo B.V., Tilburg, Nethlands
Filed Sep. 9, 1981, Ser. No. 300,678
Term of patent 14 years
U.S. Cl. D15—133

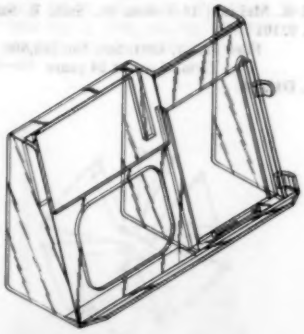
275,016
APPARATUS FOR CUTTING BY MELTING
Mototsugu Matsuo, 4-36, 2-chome, Nakazzakinishi, Kita-ku, Osaka-shi, Japan
Filed Sep. 7, 1982, Ser. No. 415,886
Claims priority, application Japan, Mar. 17, 1982, 57-011097
Term of patent 14 years
U.S. Cl. D15—144



275,017
CASSETTE FOR A ROLLED LABEL STRIP
Yo Sato, Tokyo, and Tadao Kashiwaba, Iwate, both of Japan, assignors to Kabushiki Kaisha Sato, Japan
Filed Jun. 7, 1982, Ser. No. 385,768
Term of patent 14 years
U.S. Cl. D18—19

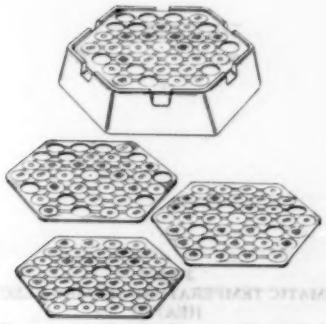


275,018
COMBINED MAGAZINE, MEMO PAD AND PENCIL RACK
Ronald N. Kessler, Youngstown, Ohio; June S. Rose, 1040 Colonial Dr., Youngstown, Ohio 44505, and Myron E. Ullman, Jr., Canfield, Ohio, assignors to Willow Molded Plastics, Inc. and June S. Rose, both of Youngstown, Ohio
Filed Dec. 17, 1981, Ser. No. 331,564
Term of patent 14 years
U.S. Cl. D19—77



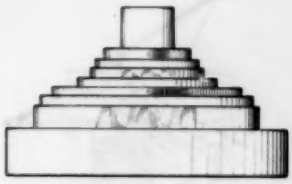
275,019
ISLAND VENDING MACHINE
Annis R. Morgan, Jr., and Eddie W. King, both of Atlanta, Ga., assignors to The Coca-Cola Company, Atlanta, Ga.
Filed Oct. 7, 1981, Ser. No. 309,470
Term of patent 14 years
U.S. Cl. D20—5

275,020
GAME BOARD
Virginia Charves, Rumford, R.I., and Wayne J. Yee, Springfield, Mass., assignors to Milton Bradley International, Inc., Springfield, Mass.
Filed Feb. 19, 1982, Ser. No. 350,325
Term of patent 14 years
U.S. Cl. D21—16

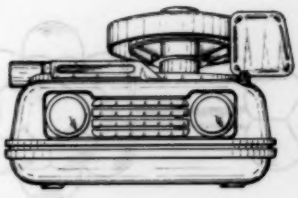


275,021
FRAME FOR THE LEADING EDGE OF A GLIDER
Jeffrey A. Brzack, 140 Maumee Trail, Lake Orion, Mich. 48035
Filed Jan. 21, 1982, Ser. No. 341,467
Term of patent 14 years
U.S. Cl. D21—91

275,022
PUZZLE TOY
Danny E. Simpson, Baltimore, Md.; D. Michael Williams, New York, N.Y.; Richard A. Chase, Baltimore, and Lawrence B. Grubb, Monkton, both of Md., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.
Filed Jun. 4, 1982, Ser. No. 385,205
Term of patent 14 years
U.S. Cl. D21—105

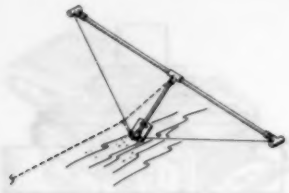


275,023
TOY AUTOMOBILE CONTROL CONSOLE
Michael W. Nuttall, So. Pasadena, Calif., assignor to Tomy Kogyo Co., Inc., Japan
Filed Dec. 21, 1981, Ser. No. 332,682
Term of patent 14 years
U.S. Cl. D21—142

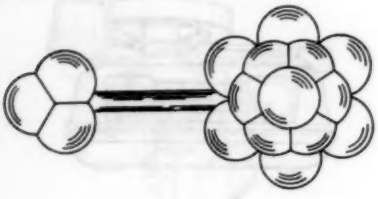


275,024
TOY BEAR BASEBALL PLAYER
Seito Ikeda, 1341 Moi Way, Honolulu, Hi. 96816
Filed Feb. 8, 1982, Ser. No. 346,929
Term of patent 14 years
U.S. Cl. D21—159

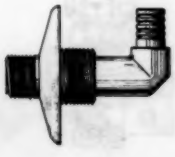
275,025
SUBSURFACE OUTRIGGER FOR THE DETECTION OF MAGNETIC FIELDS
Murphy L. Dalton, Jr., 6035 Aberdeen St., Dallas, Tex. 75230
Filed Sep. 13, 1982, Ser. No. 417,646
Term of patent 14 years
U.S. Cl. D22—22



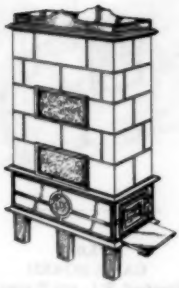
275,026
ARTIFICIAL FISH BAIT
Charles R. Huffman, R.R. #1, Box 137, Roann, Ind. 46974
Filed Jun. 18, 1982, Ser. No. 389,658
Term of patent 14 years
U.S. Cl. D22—27



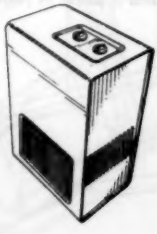
275,027
PLUMBING FITTING
Larry L. Cornell, 900 Leeward Dr., Chester, Va. 23831
Filed Dec. 28, 1981, Ser. No. 335,195
Term of patent 14 years
U.S. Cl. D23—40



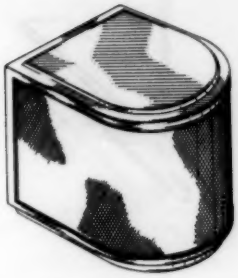
275,028
STOVE
Knud D. Schmidt, Krogagervej 10, Faustrup, Christiansfeld, Denmark
Filed Sep. 23, 1981, Ser. No. 304,953
Term of patent 14 years
U.S. Cl. D23—97



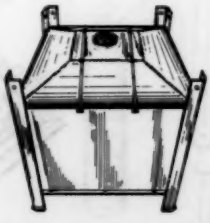
275,029
AUTOMATIC TEMPERATURE SENSING ELECTRIC HEATER
Melvin H. Boldt, Glenview; Thurber H. Morrison, Evanston, and James P. Stevens, Oak Park, all of Ill., assignors to National Presto Industries, Inc., Eau Claire, Wis.
Filed Jun. 2, 1980, Ser. No. 155,106
Term of patent 14 years
U.S. Cl. D23—122



275,030
EVAPORATIVE COOLER
Geoffrey Bowen, 9182 E. Visco Pl., Tucson, Ariz. 85710
Filed Sep. 29, 1982, Ser. No. 428,123
Term of patent 14 years
U.S. Cl. D23—139

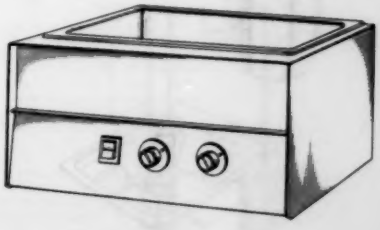


275,031
LIQUID CHEMICAL CONTAINER
K. Robert Moyse, Doylestown, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.
Filed Jul. 27, 1981, Ser. No. 287,325
Term of patent 14 years
U.S. Cl. D24—1.1



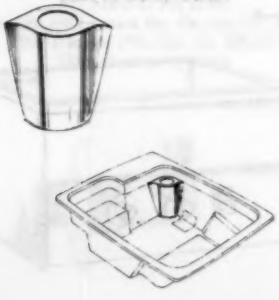
275,032
PLASMA CASSETTE ETCHER
Joseph A. Maher, Jr., Hamilton, and Arthur W. Zafiropoulo, Manchester, both of Mass., assignors to Drytek, Inc., Wilmington, Mass.
Filed Jan. 6, 1982, Ser. No. 337,373
Term of patent 14 years
U.S. Cl. D24—1.1

275,033
LABORATORY WATER BATH
Lester B. Postlewait, Glendale Heights, Ill., assignor to Lab-Line Instruments, Inc., Melrose Park, Ill.
Filed May 9, 1980, Ser. No. 148,549
Term of patent 14 years
U.S. Cl. D24—8

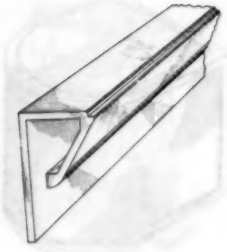


275,034
DENTAL ROOT-CANAL BROACH HANDLE
Henri Leonard, Besancon, France, assignor to Micro-Mega S.A., Besancon, France
Division of Ser. No. 248,227, Mar. 27, 1981. This application Apr. 4, 1983, Ser. No. 482,307
Claims priority, application The Hague, Nov. 20, 1980, DM/000447
Term of patent 14 years
U.S. Cl. D24—10

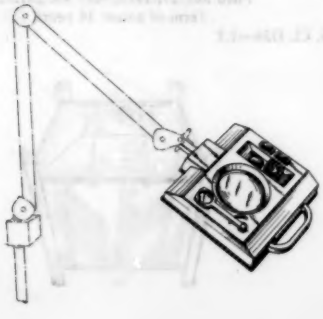
275,035
SKIMMER FOR HYDROTHERAPY SPA
Gerald C. Fishel, Anaheim, Calif., assignor to Gerico Fiberglass Products, Inc.
Continuation-in-part of Ser. No. 211,056, Nov. 28, 1980, abandoned, and a continuation-in-part of Ser. No. 175,965, Aug. 7, 1980, abandoned. This application May 26, 1983, Ser. No. 498,179
Term of patent 14 years
U.S. Cl. D24—38



275,036
CORNICE MOULD
Robert Lloyd-Jones, Unit 2, 27 Sixth Ave., Sandgate, Brisbane, Australia
Filed Mar. 12, 1982, Ser. No. 357,610
Term of patent 14 years
U.S. Cl. D25—79



275,037
COMBINED MULTIFUNCTION LAMP AND MAGNIFIER
Albert Saferstein, and Gilbert Spector, both of 480 W. Putnam Ave., Greenwich, Conn. 06830
Filed Oct. 29, 1981, Ser. No. 316,451
Term of patent 14 years
U.S. Cl. D26—51

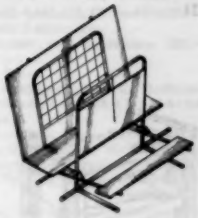


275,038
CIGARETTE URN
Grant Diebold, 1533 Avenida Selva, Fullerton, Calif. 92633
Filed Aug. 30, 1982, Ser. No. 413,129
Term of patent 14 years
U.S. Cl. D27—10

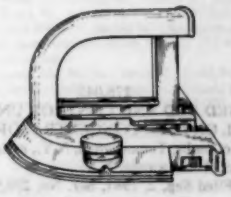
275,039
DENTAL FLOSS APPLICATOR
Robert J. Loubier, Fort Wayne, Ind., assignor to Flossrite Corporation, Fort Wayne, Ind.
Filed Oct. 20, 1982, Ser. No. 435,480
Term of patent 14 years
U.S. Cl. D28—64

275,040
COSMETIC BRUSH CONTAINER
Thomas F. Holloway, Southbury, Conn., assignor to Risdon Corporation, Naugatuck, Conn.
Filed Feb. 11, 1982, Ser. No. 347,681
Term of patent 14 years
U.S. Cl. D28—76

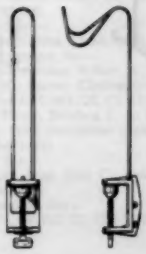
275,041
SHEEP HANDLER
Peter C. Langsford, P.O. Box 128, Quairading, Australia 6383
Filed Aug. 13, 1982, Ser. No. 408,115
Term of patent 14 years
U.S. Cl. D30—99



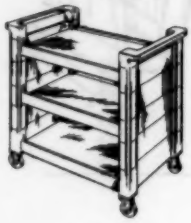
275,042
TRAVEL IRON
Davin Stowell; Tucker Viemeister, both of New York, and John Lonczak, Scarsdale, all of N.Y., assignors to Sanyei Corporation, Japan
Filed Sep. 20, 1982, Ser. No. 420,402
Term of patent 14 years
U.S. Cl. D32—70



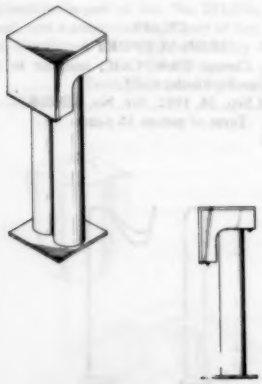
275,043
IRON SUPPORT
Salvatore Mulay, Canoga Park, Calif., assignor to Jacobson Products Co., San Fernando, Calif.
Filed Sep. 24, 1982, Ser. No. 423,035
Term of patent 14 years
U.S. Cl. D32—73



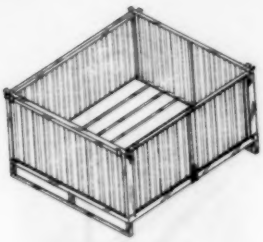
275,044
UTILITY CART
James F. Hampshire, Stephens City; Gary A. Dolphin, Sr., Winchester, both of Va.; Ronald C. Yonkers, Yonkers, Mass., and Greg P. Terek, Winchester, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Feb. 1, 1982, Ser. No. 344,812
Term of patent 14 years
U.S. Cl. D34—21



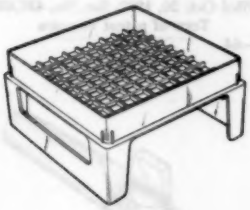
275,045
COMBINED BED AND CONTROL UNIT FOR AN INDUSTRIAL OXYGEN CONCENTRATOR OR THE LIKE
Norman R. McCombs, Tonanwanda, N.Y., assignor to Greene & Kellogg, Inc., Tonanwanda, N.Y.
Filed Sep. 2, 1981, Ser. No. 298,992
Term of patent 14 years
U.S. Cl. D34—28



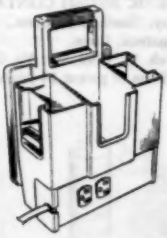
275,046
COLLAPSIBLE STORAGE BIN
Raymond C. Midgley, 1 Eastwell St., Australind, Australia
Filed Nov. 24, 1980, Ser. No. 210,041
Term of patent 14 years
U.S. Cl. D34—40



275,047
PALLET
Kjell S. Andersson, Löddeköpinge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden
Filed Dec. 22, 1981, Ser. No. 333,316
Claims priority, application Sweden, Jun. 23, 1981, 81-1435
Term of patent 14 years
U.S. Cl. D34—40



275,048
CARRIER FOR A DRILL AND DRILL ACCESSORIES
Francis R. Bannigan, 64 Duerdin St., North Clayton, Victoria, 3168, Australia
Filed Apr. 12, 1982, Ser. No. 367,592
Term of patent 14 years
U.S. Cl. D34—44



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PATENTS WERE ISSUED ON THE 7TH DAY OF AUGUST, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
Niekamp, Carl W.; and Seidman, Martin, 4,464,204, Cl. 127-36.000.
A. G. Davis Gage & Engineering Co.: *See*—
Pieczulewski, Daniel J., 4,463,488, Cl. 29-159.200.
A. Nattermann & Cie GmbH: *See*—
Betzing, Hans; and Leyck, Sigurd, 4,464,379, Cl. 424-263.000.
A.R.F. Products, Inc.: *See*—
Owerko, John R., 4,464,792, Cl. 455-128.000.
AB Rollfilm: *See*—
Rothfjell, Rolf E., 4,464,448, Cl. 430-22.000.
AB Volvo: *See*—
Rydquist, Jan E.; Sandberg, Lars; and Wallin, Ralf, 4,463,565, Cl. 60-602.000.
ACF Industries, Incorporated: *See*—
Sittner, Edward H., 4,463,827, Cl. 182-93.000.
Tansuwan, Chusak, 4,463,723, Cl. 123-438.000.
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Adolph Coors Company: *See*—
Huffman, Stanley S.; Dorfman, Jan L.; Frenkel, Robert L.; and Pearce, Ronald A., 4,463,844, Cl. 194-4.00C.
Advanced Drilling Corporation: *See*—
Horstmeyer, Robert J.; and Weick, Larry J., 4,463,814, Cl. 175-45.000.
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Agency of Industrial Science and Technology: *See*—
Sugiura, Masaaki, 4,464,498, Cl. 524-145.000.
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Takahashi, Yoshio; Ozawa, Takeo; Sakamoto, Ryuji; Kanari, Katsuhiko; and Kamimoto, Masayuki, 4,463,799, Cl. 165-10.000.
Agfa-Gevaert Aktiengesellschaft: *See*—
Findeis, Gunter; Fergg, Berthold; Zahn, Wolfgang; and Kuhn, Gerhard, 4,464,045, Cl. 355-38.000.
Matejec, Reinhart; Nittel, Fritz; and Sobel, Johannes, 4,464,464, Cl. 430-546.000.
Agfa-Gevaert N.V.: *See*—
Deconinck, Hugo F., 4,463,943, Cl. 271-21.000.
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Agrawal, Rakesh; and Cormier, Thomas E., 4,464,188, Cl. 62-13.000.
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Mango, Phillip A., 4,464,519, Cl. 526-200.000.
Aisan Kogyo Kabushiki Kaisha: *See*—
Fukaya, Kastuyoshi; Tokuda, Akira; and Hirano, Hitoshi, 4,463,724, Cl. 123-438.000.
Aisin Industry Co., Ltd.: *See*—
Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,464,311, Cl. 261-44.00C.
Aisin Seiki Kabushiki Kaisha: *See*—
Hachisuka, Hiroshi; and Kuga, Fumiharu, 4,463,820, Cl. 180-143.000.
Kaneko, Kenichi, 4,463,463, Cl. 5-68.000.
Kazaoka, Kenichi; Okuyama, Teiji; and Nishikawa, Masumi, 4,463,626, Cl. 74-493.000.
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Aisin-Warner Kabushiki Kaisha: *See*—
Kawamoto, Mutsumi; and Sakakibara, Shiro, 4,464,145, Cl. 474-28.000.
Aislinger, Dieter E.: *See*—
Pusch, Gunther; Aislinger, Dieter E.; Hoffmann, Alexander; and Pusch, Klaus-Werner, 4,464,418, Cl. 427-44.000.
Aizawa, Masanori: *See*—
Ohta, Saburo; Nakamura, Shoji; Hayashi, Katsutake; Yomogida, Katsuyuki; Morohoshi, Hideo; Hirose, Seiichi; Uehara, Keiichi; Aizawa, Masanori; Sato, Yoshihisa; Ichikawa, Hideyuki; Tejima, Masayuki; and Togano, Seisaku, 4,464,290, Cl. 252-522.00R.
Ajima, Akio: *See*—
Tanouchi, Tadao; Kawamura, Masanori; Ajima, Akio; Mohri, Tetsuya; Hayashi, Masaki; Terashima, Hiroshi; Hirata, Fumio; and Morimura, Takeshi, 4,464,382, Cl. 424-270.000.
Akeroyd, Richard T. Dual fuel diesel engine. 4,463,734, Cl. 123-525.000.
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Kitagawa, Junji; Akita, Shigeyuki; and Kitamura, Sotoo, 4,463,604, Cl. 73-296.000.
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Albizzati, Enrico: *See*—
Scata, Umberto; Albizzati, Enrico; and Giannetti, Enzo, 4,464,478, Cl. 502-111.000.
Alcon Laboratories, Inc.: *See*—
York, Billie M., Jr., 4,464,385, Cl. 424-273.00R.
Alden, Dale E.: *See*—
Cogswell, John; Fokos, Robert F.; and Alden, Dale E., 4,463,640, Cl. 83-116.000.
Alexander, Jimmy R.: *See*—
Zimmerman, Wiley E.; Alexander, Jimmy R.; Boles, Don E.; and Bockhorst, Rhea W., 4,464,564, Cl. 219-497.000.
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Ford, David E., Jr.; and Kannenberg, Daniel G., 4,464,605, Cl. 315-134.000.
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Allied Corporation: *See*—
Anderson, Philip M., III; Raskin, Donald; and Reich, Ronald K., 4,463,610, Cl. 73-654.000.
Alloy Surfaces Company, Inc.: *See*—
Baldi, Alfonso L., 4,464,430, Cl. 428-201.000.
Aloka Co., Ltd.: *See*—
Koyano, Akira; and Mizuno, Seiichiro, 4,463,763, Cl. 128-661.000.
Alps Electric Co., Ltd.: *See*—
Kaneko, Akio; and Kajiwara, Hitoshi, 4,464,781, Cl. 381-12.000.
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Bush, J. Finley, 4,464,347, Cl. 423-112.000.
Hildeman, Gregory J.; and Sanders, Robert E., Jr., 4,464,199, Cl. 75-249.000.
Ramser, Robert A.; Booz, A. Daivd; Barch, Daniel R.; and Cebulak, Walter S., 4,464,103, Cl. 425-7.000.
ALZA Corporation: *See*—
Wong, Patrick S.; Langston, Jimmy B.; and Leeper, Harold M., 4,464,258, Cl. 210-205.000.
Amada Company, Limited: *See*—
Minato, Yoshiharu; and Tobita, Chuo, 4,463,642, Cl. 83-530.000.
AMBAC Industries, Incorporated: *See*—
Bullis, Robert H.; DiDomenico, Robert A.; Kimberley, John A.; McHugh, Thomas M.; Parent, Christopher A.; Voss, James R.; and Wiegand, Walter J., 4,463,729, Cl. 123-478.000.
Amend, William E.; and Toner, Stephen J., to Transamerica Delaval Inc. Power production with two-phase expansion through vapor dome. 4,463,567, Cl. 60-671.000.
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Farrell, Christopher J.; Tsai, Boh C.; and Wachtel, James A., 4,464,443, Cl. 428-688.000.
American Hoechst Corporation: *See*—
Pollard, John K., Jr., 4,464,165, Cl. 604-5.000.

American Hospital Supply Corporation: *See—*
Barger, Larry N., deceased; Barger, William A., administrator; and McCord, Kenneth R., 4,464,179, Cl. 604-250.000.
Redmond, Russell J.; and Hannula, Donald L., 4,464,168, Cl. 604-9.000.
American Magnetics Corporation: *See—*
Baus, Rene, 4,464,687, Cl. 360-2.000.
American Toxic Disposal Partners: *See—*
Meenan, William C.; and Sullivan, George D., 4,463,691, Cl. 110-346.000.
Ameyama, Minoru: *See—*
Komai, Hiromichi; and Ameyama, Minoru, 4,464,668, Cl. 346-75.000.
Amin, Jayendra J.: *See—*
Zeno, Robert V.; Lutz, George A.; and Amin, Jayendra J., 4,463,573, Cl. 62-157.000.
Ammermann, Eberhard: *See—*
Janssen, Bernd; Meyer, Norbert; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,464,381, Cl. 424-269.000.
AMP Incorporated: *See—*
Ceresa, Myron; Vyas, Frank N.; and Zimmerman, Richard H., 4,464,541, Cl. 174-84.00C.
Goodman, Joseph R.; Woratyla, John A.; and Zell, Dale R., 4,464,003, Cl. 339-99.00R.
Parmer, Kenneth R., 4,464,007, Cl. 339-220.00T.
Reavis, Robert P.; Mayberry, Mickey L.; Willette, David; Weisenburger, Lawrence P.; and Bates, Reginald A., 4,463,998, Cl. 339-40.000.
Soes, Lucas, 4,464,550, Cl. 200-46.000.
Amundson, E.: *See—*
Patil, Arun A.; and Amundson, E., 4,463,758, Cl. 128-303.00B.
Anderle, Joseph A.; and Dodich, James, to Levolor Lorentzen, Inc. Decorative ceiling or wall. 4,463,536, Cl. 52-488.000.
Anderson, Carl. Pump jack. 4,463,828, Cl. 182-136.000.
Anderson, Catherine A.: *See—*
Anderson, Stephen T.; Anderson, Catherine A.; and Kapsen, Terrance J., 4,463,764, Cl. 128-719.000.
Anderson, Philip M., III; Raskin, Donald; and Reich, Ronald K., to Allied Corporation. Tuned vibration detector. 4,463,610, Cl. 73-654.000.
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Andersson, Bengt U. I.; and Larsson, Sven B. Battery post cable connector. 4,464,008, Cl. 339-226.000.
Andoh, Ikuhiro: *See—*
Suzuki, Hiroyuki; Andoh, Ikuhiro; and Watanabe, Kouji, 4,464,002, Cl. 339-97.00P.
Andreadakis, Nicholas C., to Burroughs Corporation. Method of making a display panel. 4,464,135, Cl. 445-25.000.
Andree, Dietrich, to Hoesch Werke Aktiengesellschaft. Safety mounting for large antifriction bearings. 4,463,995, Cl. 308-207.00R.
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Andres, Johannes; Hasenkamp, Rainer; and Merkel, Heinrich, to Henkel Kommanditgesellschaft auf Aktien. Aqueous adhesive composition useful for labeling bottles. 4,464,202, Cl. 106-139.000.
Ani-Live Film Services, Inc.: *See—*
Cooper, Sidney; and Jacob, Ezekiel J., 4,464,453, Cl. 430-126.000.
Anic S.p.A.: *See—*
Pittalis, Francesco; Bartoli, Francesco; and Giovannoni, Guido, 4,464,321, Cl. 264-83.000.
Annen, Klaus: *See—*
Hofmeister, Helmut; Petzoldt, Karl; Annen, Klaus; Laurent, Henry; Wiechert, Rudolf; and Nishino, Yukeshige, 4,464,365, Cl. 424-243.000.
Anthony, Albert J. Surgical pack retention device. 4,464,114, Cl. 433-229.000.
Anthony, John, to Union Carbide Corporation. Multilayer film having a layer of low pressure, low density heterogeneous ethylene copolymers. 4,464,426, Cl. 428-35.000.
Antonenko, Vladimir F.: *See—*
Surovikin, Vitaly F.; Antonenko, Vladimir F.; Babich, Gennady V.; Bobrik, Mikhail Y.; Korenyak, Nikolai K.; Novikov, Vasily V.; Voloshin, Gennady A.; Belyaev, Georgy A.; Gordeev, Alexandr V.; Gallyamov, Nail I.; and Krikunenko, Anatoly F., 4,464,314, Cl. 261-79.00A.
Antonio Corona & Associates R & D Ltd.: *See—*
Corona, Antonio; and Ho, Paul F., 4,463,788, Cl. 145-63.000.
Aoi Chemical, Inc.: *See—*
Niwa, Hazime; and Furukawa, Saburo, 4,464,424, Cl. 427-296.000.
Aoki Kabushiki Kaisha: *See—*
Okuyama, Yukio, 4,463,662, Cl. 92-69.00R.
Aono, Tetsuya: *See—*
Matsumura, Koichi; and Aono, Tetsuya, 4,464,530, Cl. 536-124.000.
Apple Computer, Inc.: *See—*
Lapson, William F.; and Atkinson, William D., 4,464,652, Cl. 340-710.000.
Applegate, Robert D., to Driall, Inc. Grain drier and method of drying grain. 4,463,503, Cl. 34-172.000.
Applegate, Robert D., to Driall, Inc. Grain drier and method of drying grain. 4,463,504, Cl. 34-175.000.
Applied Power Inc.: *See—*
Sonneborn, Lamburtus J., 4,463,818, Cl. 180-89.150.
Arad, Avi: *See—*
Romero, Hugo; Arad, Avi; Nagel, Dietmar; and Kennedy, Melvin, 4,464,124, Cl. 434-321.000.
Aragaki, Tsunehide; and Noguchi, Yukio. Water-safe hair dryer circuit. 4,464,582, Cl. 307-118.000.
Arai, Isao: *See—*
Saito, Yoshikuni; Hashimoto, Hitoshi; Arai, Isao; and Wada, Minoru, 4,463,490, Cl. 29-566.100.
Arai, Mitutaka, to Konishiroku Photo Industry Co., Ltd. Magnetic recording medium. 4,464,279, Cl. 252-62.540.
Argoudelis, Alexander D.; and Stroman, David W., to Upjohn Company, The. Process of producing lincomycin nucleotides. 4,464,466, Cl. 435-92.000.
Arias-Alvarez, Jose A., to T&R Chemicals, Inc. Treatment of epilepsy with bisulfite. 4,464,357, Cl. 424-162.000.
Arji, Shigeru: *See—*
Satake, Toshihiko; Kagawa, Kiyoto; and Arji, Shigeru, 4,463,665, Cl. 99-488.000.
Arima, Hideki: *See—*
Murase, Kiyoshi; Mase, Toshiyasu; Arima, Hideki; Niigata, Kunihiro; Tomioka, Kenichi; and Kobayashi, Shinichiro, 4,464,384, Cl. 424-270.000.
Arinc Research Corporation: *See—*
Brown, Harry W., 4,464,141, Cl. 464-75.000.
Arisaki, Kenji, to Babcock-Hitachi, Ltd. Heat recovery process in coal gasification. 4,464,183, Cl. 48-210.000.
Armament Research Corporation of America: *See—*
Barnes, Thomas J.; and Parry, William H., 4,463,654, Cl. 89-128.000.
Armentrout, Richard W.; and Brown, Ronald D., to University of Cincinnati. Biologically engineered plasmid coding for production of β-glucosidase, organisms modified by this plasmid and methods of use. 4,464,471, Cl. 435-253.000.
Armstrong World Industries, Inc.: *See—*
Kane, John F., 4,464,606, Cl. 315-158.000.
Arnold, Don C.; and Wilcox, Thomas J., to Indiana Brass, Inc. Roman tub fixture. 4,463,460, Cl. 4-191.000.
Arnold, Harmon W.; Erwin, Galen B.; Gowing, John P.; and Mundell, David D., to Flex-O-Lators, Inc. Method for reinforcing net materials. 4,464,218, Cl. 156-244.120.
Aro Corporation, The: *See—*
Sartran, Bernard C., 4,463,889, Cl. 227-112.000.
Artaud, Robert; Aubert, Michel; Lemercier, Guy; Lambert, Paul; and Chevallier, Gilbert, to Commissariat a l'Energie Atomique. Fast neutron nuclear reactors. 4,464,334, Cl. 376-298.000.
Arthur D. Little, Inc.: *See—*
McCullough, John E., 4,463,591, Cl. 72-360.000.
Arthur, Gene M., to Imperial Clevite Inc. Apparatus for maintaining tension of an endless drive member. 4,464,146, Cl. 474-133.000.
Arthur, High M.; Dyett, Derek H.; and Wood, Godfrey A., to Molins Limited. Cigarette and cigarette filter making machine. 4,463,766, Cl. 131-84.00R.
Arthur Shaw Manufacturing Limited: *See—*
Douglas, Jack E., 4,463,976, Cl. 292-202.000.
Artois, Fernand: *See—*
Mercatoris, Robert; Artois, Fernand; Colling, Joseph; and Feitler, Albert, 4,464,055, Cl. 366-26.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Hattori, Yoshihiro; Watanabe, Takashi; and Maeda, Kunio, 4,464,435, Cl. 428-409.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Okura, Zenichi; and Kohmoto, Shinsuke, 4,464,040, Cl. 354-455.000.
Asakura, Masamitsu, to Hitachi, Ltd. Knock sensor for combustion engines. 4,463,596, Cl. 73-35.000.
Asakura, Osamu: *See—*
Nozaki, Mineo; Ozawa, Toshiaki; Asakura, Osamu; Kondo, Hiroatsu; and Okamura, Shigeru, 4,463,672, Cl. 101-93.090.
Asari, Akira; Noyori, Tatsuhiko; Tabuchi, Takahisa; Masuda, Tsuneharu; and Mizoguchi, Masao, to Kabushiki Kaisha Kobe Seiko Sho. Indirect extrusion press. 4,463,589, Cl. 72-273.500.
ASEA Aktiebolag: *See—*
Stenerhag, Bo; and Wirsen, Lars E., 4,464,700, Cl. 361-307.000.
Ashiba, Masahiro, to Tokico Ltd. Hydraulic damper. 4,463,839, Cl. 188-299.000.
Ashland Oil, Inc.: *See—*
Goel, Anil B., 4,464,303, Cl. 260-410.000.
Gruber, Bruce A., 4,464,521, Cl. 526-273.000.
Myers, Virginia K.; McKay, Bill E., Jr.; and Busch, Lloyd E., 4,464,250, Cl. 208-120.000.
Aso, Kinichi; and Shinada, Kazuyoshi, to Yanmar Diesel Engine Company Ltd. Seal arrangement between an outdrive unit and a hull of a vessel. 4,464,128, Cl. 440-112.000.
Associated Engineering Italy S.p.A.: *See—*
Raggi, Lodovico, 4,463,487, Cl. 29-156.630.
AT&T Bell Laboratories: *See—*
Emkey, William L., 4,464,022, Cl. 350-377.000.
Logan, Ralph A.; and Tsang, Won-Tien, 4,464,211, Cl. 148-171.000.
Sabia, Raffaele A., 4,464,013, Cl. 350-96.230.
Tsang, Won-Tien, 4,464,342, Cl. 422-247.000.
AT&T Laboratories: *See—*
Thelen, William, 4,464,658, Cl. 340-825.500.
AT&T Technologies, Inc.: *See—*
Colwell, Darrel R., 4,464,227, Cl. 202-170.000.

Atkinson, William D.: *See—*
Lapson, William F.; and Atkinson, William D., 4,464,652, Cl. 340-710.000.

Atlantic Richfield Company: *See—*
Mooi, John; and Johnson, Marvin F. L., 4,464,249, Cl. 208-65.000.

Atsumi, Toshio; Tarumi, Yuzo; Sanjiki, Tetsutaro; Takebayashi, Yoshiaki; and Yoshida, Noboru, to Sumitomo Chemical Company, Limited. 4-Carbamoylimidazolium-5-olate derivatives. 4,464,531, Cl. 536-17.400.

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Artaud, Robert; Aubert, Michel; Lemercier, Guy; Lambert, Paul; and Chevallier, Gilbert, 4,464,334, Cl. 376-298.000.

Auchapt, Pierre; and Ferlay, Aime , to Commissariat a l'Energie Atomique. Vortex apparatus for the continuous producing of a precipitate. 4,464,341, Cl. 422-202.000.

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Thornton, Leif N., 4,463,886, Cl. 225-96.500.

Autophon A.G.: *See—*
Masur, Christian, 4,464,766, Cl. 375-49.000.

AutoWeigh Co.: *See—*
MacFarlane, John L., 4,463,816, Cl. 177-119.000.

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Bisagni, Emile; Dubertret, Louis; Moron, Jacqueline; Averbeck, Dietrich; Papadopoulo, Dora; Blais, Jocelyne; Vigny, Paul; Schwencke, Maria N.; Moustacchi, Ethel; Nocentini, Silvano; and Zajdela, Francois, 4,464,354, Cl. 424-59.000.

Avibank Mfg., Inc.: *See—*
Duran, John A., 4,464,090, Cl. 411-103.000.

Avrameas, Stratis; Broun, Georges; Selegny, Eric; and Thomas, Daniel, to Agence Nationale de Valorisation de la Recherche (ANVAR). Immobilization of active protein by cross-linking to inactive protein. 4,464,468, Cl. 435-177.000.

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O'Callaghan, Cynthia H.; Ayres, Barry E.; Newall, Christopher E.; Livermore, David G. H.; and Sutherland, Derek R., 4,464,368, Cl. 424-246.000.

Azegami, Hitoshi: *See—*
Hirabayashi, Kenji; and Azegami, Hitoshi, 4,464,433, Cl. 428-336.000.

Azizian, Hormoz: *See—*
Rempel, Gary L.; and Azizian, Hormoz, 4,464,515, Cl. 525-338.000.

B. F. Goodrich Company, The: *See—*
Brown, Randall J., 4,464,495, Cl. 524-87.000.
Klein, Richard G., 4,464,654, Cl. 340-676.000.

B Nippondenso Co., Ltd.: *See—*
Yoshimi, Akiro; Kuwajima, Takeshi; Ootsuka, Fumio; and Matsushima, Takeo, 4,463,801, Cl. 165-43.000.

Baba, Masao: *See—*
Sato, Takahisa; Nakashima, Sumio; and Baba, Masao, 4,464,229, Cl. 203-60.000.

Babcock-Hitachi, Ltd.: *See—*
Arisaki, Kenji, 4,464,183, Cl. 48-210.000.

Babcock & Wilcox Company, The: *See—*
Agarwal, Suresh C., 4,464,720, Cl. 364-431.020.
Thompson, William L., 4,463,612, Cl. 73-861.220.

Babich, Gennady V.: *See—*
Surovikin, Vitaly F.; Antonenko, Vladimir F.; Babich, Gennady V.; Bobrik, Mikhail Y.; Korenyak, Nikolai K.; Novikov, Vasily V.; Voloshin, Gennady A.; Belyaev, Georgy A.; Gordeev, Alexandr V.; Gallyamov, Nail I.; and Krikunenko, Anatoly F., 4,464,314, Cl. 261-79.00A.

Babitzka, Rudolf; Beck, Walter; and Schlagmuller, Walter, to Robert Bosch GmbH. Diesel engine fuel injection system. 4,463,727, Cl. 123-458.000.

Bac, Jean-Claude, to Caoutchouc Manufacture et Plastiques. Pneumatic deicers for aircraft. 4,463,919, Cl. 244-134.00A.

Backes, Reiner; Schmidtpott, Friedrich; and Neal, Mathew, to ITT Industries, Inc. Dynamic synchronous binary counter with stages of identical design. 4,464,773, Cl. 377-116.000.

Bader, Johann: *See—*
Simon, Helmut; Bader, Johann; and Guenther, Helmut, 4,464,235, Cl. 204-73.00R.

Baer, Ted A.; and Broadbent, Scott G., to Zoecon Corporation. Substituted acid chloride process. 4,464,307, Cl. 260-544.00N.

Bailey, August V.; Boudreaux, Gordon J.; and Sumrell, Gene, to United States of America, Agriculture. Process for controlling antimicrobial activity using glycolic acid derivatives. 4,464,392, Cl. 424-313.000.

Bakanowski, Stephen M.; and Miller, Matthew S., to General Electric Company. Dynamic bottom feed for microwave ovens. 4,464,554, Cl. 219-10.55F.

Balaban, Alvin R.; and Steckler, Steven A., to RCA Corporation. Low frequency digital comb filter system. 4,464,675, Cl. 358-31.000.

Balajthy, Zoltan: *See—*
Kocsis, Jozsef K.; Kiss, Laszlo ; Balajthy, Zoltan; Nagy, Peter; Pai nee Hazkoto, Gizella; Zarubai, Miklos; Sipos, Geza; Romhanyi, Andras; and Kokai, Rudolf, 4,464,504, Cl. 524-443.000.

Baldi, Alfonso L., to Alloy Surfaces Company, Inc. Metal diffusion. 4,464,430, Cl. 428-201.000.

Baldus, Heinz-Dieter: *See—*
Heinemann, Otto; Baldus, Heinz-Dieter; and Schmits, Heinz-Herbert, 4,464,112, Cl. 432-106.000.

Ball, Brian R.: *See—*
Ball, Joel E.; and Ball, Brian R., 4,463,885, Cl. 224-250.000.

Ball Corporation: *See—*
Lalezari, Farzin; and Munson, Robert E., 4,464,663, Cl. 343-700.0MS.

Ball, Joel E.; and Ball, Brian R., to Nors A/S of America, Inc., T Conn. Ski carrier strap. 4,463,885, Cl. 224-250.000.

Ball, William H., to Boeing Company, The. Flush inlet for supersonic aircraft. 4,463,772, Cl. 137-15.200.

Ballu, Patrick J., to Tecnosna. Device for depositing a treatmest liquid, such as a weedkiller, onto plants. 4,463,521, Cl. 47-1.500.

Bandy, Peter B.: *See—*
Dixon, Jerry D.; Farrell, Robert H.; Merckel, Gerald U.; Neely, Jack D.; Schmitt, Stephen A.; Verdoorn, William G., Jr.; and Bandy, Peter B., 4,464,718, Cl. 364-200.000.

Banks, Robert L.: *See—*
Kukes, Semyon G.; Harris, Jesse R.; and Banks, Robert L., 4,464,251, Cl. 208-221.000.

Barale, Danilo, to RIV-SKF Officine di Villar Perosa S.p.A. Hydraulic tappet with automatic taking up of the clearance for endothermic engines. 4,463,713, Cl. 123-90.550.

Barch, Daniel R.: *See—*
Ramser, Robert A.; Booz, A. Daivd; Barch, Daniel R.; and Cebulak, Walter S., 4,464,103, Cl. 425-7.000.

Barger, Larry N., deceased; by Barger, William A., administrator; and McCord, Kenneth R., to American Hospital Supply Corporation. Medical flushing valve. 4,464,179, Cl. 604-250.000.

Barger, William A., administrator: *See—*
Barger, Larry N., deceased; Barger, William A., administrator; and McCord, Kenneth R., 4,464,179, Cl. 604-250.000.

Barlow, Gordon A.; Krutsch, John R.; Smollar, Marvin; and Liedtke, Ronald, to Gordon Barlow Design. Self-contained and self-propelled toy vehicle. 4,463,515, Cl. 446-409.000.

Barlow, Peter L., to Shell Oil Company. Preformed membrane. 4,464,427, Cl. 428-40.000.

Barmatz, Martin B., to United States of America, National Aeronautics and Space Administration. High temperature acoustic levitator. 4,463,606, Cl. 73-505.000.

Barnes, Alan C.; Kay, David P.; Kennewell, Peter D.; Parker, Frederick L.; and Rowlands, David A., to Roussel Uclaf. 4,5-Dihydroimidazo-[1,2-a]quinoxaline-2-carboxylic acids and their derivatives with antiallergic activity. 4,464,373, Cl. 424-250.000.

Barnes, James E.; Morkoetter, James G.; and Robbins, Norman M., to Custom Tool, Inc. Multipurpose opener. 4,463,631, Cl. 81-3.10R.

Barnes, Lell E.: *See—*
Groudan, Alan I.; Pitt, Garry E.; and Barnes, Lell E., 4,464,747, Cl. 371-50.000.
Schroeder, George F.; Pitt, Garry E.; Scully, John F.; and Barnes, Lell E., 4,464,752, Cl. 371-38.000.

Barnes, Thomas J.; and Parry, William H., to Armament Research Corporation of America. Conversion kit for assault rifle and converted rifle of compact configuration. 4,463,654, Cl. 89-128.000.

Baron, George B.; and Thompson, George J., to Dresser Industries, Inc. Power shovel having improed hoist system. 4,464,093, Cl. 414-687.000.

Barr & Stroud Limited: *See—*
Farlow, Adrian R., 4,464,048, Cl. 356-5.000.

Barter, Archie M., to Tektronix, Inc. Current and voltage protection for a power supply circuit. 4,464,709, Cl. 363-16.000.

Bartoli, Francesco: *See—*
Pittalis, Francesco; Bartoli, Francesco; and Giovannoni, Guido, 4,464,321, Cl. 264-83.000.

Barzukov, Oleg P.: *See—*
Ivanov, Nikolai A.; Ivanov, Boris G.; Zagoratsky, Leonid P.; Mitrofanov, Evgeny S.; Cherkassky, Vladimir A.; Finkelshtein, Georgy A.; Blekhman, Ilya I.; Barzukov, Oleg P.; Kaljunov, Gennady A.; Khinich, Isaak Y.; and Turkin, Vladimir Y., 4,463,908, Cl. 241-207.000.

BASF Aktiengesellschaft: *See—*
Autzen, Horst; Motz, Herbert; Rudolf, Peter; Sarnecki, Wilhelm; Steck, Werner; and Vaeth, Guenter, 4,464,352, Cl. 423-634.000.
Belde, Horst; Hartmann, Eduard; and Daubach, Ewald, 4,464,203, Cl. 106-308.00N.
Degen, Helmut; Dix, Johannes P.; Grund, Norbert; Hansen, Guenter; and Krallmann, Reinhold, 4,464,181, Cl. 8-639.000.
Gramlich, Walter; Himmele, Walter; Martin, Christoph; Pommer, Ernst-Heinrich; and Siegel, Hardo, 4,464,370, Cl. 424-248.400.
Janssen, Bernd; Meyer, Norbert; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,464,381, Cl. 424-269.000.
Kroeger, Ingo; and Wuerzer, Bruno, 4,464,195, Cl. 71-91.000.
Mueller, Herbert, 4,464,526, Cl. 528-358.000.
Naarmann, Herbert; Penzien, Klaus; Muensch, Volker; and Franz, Klaus-Dieter, 4,464,511, Cl. 525-61.000.
Seybold, Guenther, 4,464,284, Cl. 252-301.210.
Simon, Helmut; Bader, Johann; and Guenther, Helmut, 4,464,235, Cl. 204-73.00R.
Strehler, Hugo; Kegel, Robert; Valentin, Guenter; and Hoersuf, Werner, 4,464,266, Cl. 210-703.000.
Tonne, Peter; and Jaedicke, Hagen, 4,464,537, Cl. 548-211.000.

BASF Wyandotte Corporation: *See—*
Kaneko, Thomas M.; Dutton, Daniel R.; and Kim, Bongsub, 4,464,193, Cl. 71-83.000.

Basic Line, Inc.: *See—*
Licari, Vito; and Licari, Yaffa, 4,463,853, Cl. 211-37.000.

Basic Packaging Systems, Inc.: *See—*
Blankenship, Bernard F., 4,464,790, Cl. 383-37.000.

Bastrikov, Valery L.: *See*—
Korshunov, Evgeny A.; Kuznetsov, Alexandr N.; Ovodenko, Maxim B.; Kuzmin, Gennady G.; Kostrov, Valery P.; Timofeev, Alexandr N.; Bastrikov, Valery L.; and Meschaninova, Tatyana V., 4,463,796, Cl. 164-460.000.

Bates, Reginald A.: *See*—
Reavis, Robert P.; Mayberry, Mickey L.; Willette, David; Weisenburger, Lawrence P.; and Bates, Reginald A., 4,463,998, Cl. 339-40.000.

Baudoin, Michel; Carru, Jean-Pierre; and Veislinger, Yves, to Thomson-CSF. Multifunctional communication terminal connected to two telephone lines and with partial remote supply. 4,464,542, Cl. 179-2.00C.

Bauer, Herbert: *See*—
Rapisarda, Anthony; Camps, Edilia; and Bauer, Herbert, 4,464,281, Cl. 252-174.210.

Baughman, Walter P., to Plastomer Corporation. Damper device and method of forming. 4,463,931, Cl. 251-298.000.

Baumann, Hans-Peter, to Sandoz Ltd. Compositions and method for dyeing or printing with disperse dyes. 4,464,180, Cl. 8-557.000.

Baumann, Kurt: *See*—
Miller, Helmut; Baumann, Kurt; Halder, Franz; and Meystre, Noel, 4,464,580, Cl. 290-52.000.

Baumgartner, Hans: *See*—
Sudbeck, Rainer; and Baumgartner, Hans, 4,463,554, Cl. 60-274.000.

Baus, Rene, to American Magnetics Corporation. Jitter-free gear arrangement for equipment requiring precision mechanical movement. 4,464,687, Cl. 360-2.000.

Baxter Travenol Laboratories, Inc.: *See*—
Michaels, Thomas L., 4,464,316, Cl. 261-121.00R.

Bayer Aktiengesellschaft: *See*—
Alberts, Heinrich; Steinberger, Helmut; and Kortmann, Wilfried, 4,464,506, Cl. 524-588.000.
Ostlinning, Edgar; and Idel, Karsten, 4,464,507, Cl. 524-710.000.

Bayerisches Druckguss-Werk Thurner KG: *See*—
Thurner, Hans, 4,463,793, Cl. 164-155.000.

BBC Brown, Boveri & Company, Limited: *See*—
Borinelli, Enrico; and Buhler, Karl, 4,463,857, Cl. 212-166.000.

Beach, John R., to Signode Corporation. Strap dispenser. 4,463,911, Cl. 242-55.200.

Beall, George H.; Chirino, Agustin M.; Chyung, Kenneth; Martin, Francis W.; and Taylor, Mark P., to Corning Glass Works. Glass-ceramic articles containing osumilite. 4,464,475, Cl. 501-9.000.

Bechara, Ibrahim S.; and Mascioli, Rocco L., to Air Products and Chemicals, Inc. Amino and amido dialkyl tin carboxylates and their use in preparing polyurethane products. 4,464,490, Cl. 521-128.000.

Beck, Walter: *See*—
Babitzka, Rudolf; Beck, Walter; and Schlagmuller, Walter, 4,463,727, Cl. 123-458.000.

Becker, Manfred; and Ortlepp, Hilmar, to Deere & Company. Hydraulic control valve. 4,463,819, Cl. 180-132.000.

Becker, Michael T.; and O'Brien, William D. Mounting means for a water unit to a printing press. 4,463,674, Cl. 101-148.000.

Becker, Willi, to Willi Becker Ingenieurburo GmbH. Rudder for watercraft. 4,463,700, Cl. 114-162.000.

Beckman Instruments, Inc.: *See*—
Buzza, Edmund E., 4,463,615, Cl. 73-863.320.
Parkes, Christopher W.; and Franklin, Robert C., 4,464,727, Cl. 364-718.000.

Beek, Achim: *See*—
Hentzschel, Hanspeter; and Beek, Achim, 4,464,584, Cl. 307-200.00A.

Beer, Michael W., to Eurobond Coatings Limited. Method and apparatus for laminating a dried adhesive film to a substrate. 4,464,220, Cl. 156-273.300.

Beguin, Annie: *See*—
Le Berre, Serge; Hareng, Michel; Beguin, Annie; and Thirant, Lydie, 4,464,020, Cl. 350-350.00S.

Beisch, Hans R., to NI Industries, Inc. Simulated wire wheel trim and method. 4,463,990, Cl. 301-37.0SS.

Belde, Horst; Hartmann, Eduard; and Daubach, Ewald, to BASF Aktiengesellschaft. Highly concentrated, dust-free, solid and readily dispersible pigment formulations and their use. 4,464,203, Cl. 106-308.00N.

Belfoure, Edward L., to General Electric Company. Carbon black filled flame retardant polycarbonate compositions. 4,464,497, Cl. 524-114.000.

Bell Maschinenfabrik AG: *See*—
Bubik, Alfred; Kummer, Oskar; and Rosenberg, Burkard, 4,464,225, Cl. 162-181.600.

Bell Telephone Laboratories, Incorporated: *See*—
Furuya, Kazuhito, 4,464,762, Cl. 372-50.000.
Werner, Jean J., 4,464,545, Cl. 179-170.200.

Bellows, Alfred H., to GTE Laboratories Incorporated. Circuit breakers. 4,464,641, Cl. 335-23.000.

Belyaev, Georgy A.: *See*—
Surovikin, Vitaly F.; Antonenko, Vladimir F.; Babich, Gennady V.; Bobrik, Mikhail Y.; Korenyak, Nikolai K.; Novikov, Vasily V.; Voloshin, Gennady A.; Belyaev, Georgy A.; Gordeev, Alexandr V.; Gallyamov, Nail I.; and Krikunenko, Anatoly F., 4,464,314, Cl. 261-79.00A.

Bendix Corporation, The: *See*—
Collins, Gordon T., 4,464,001, Cl. 339-90.00R.
Taig, Alistair G., 4,463,843, Cl. 192-111.00A.
Werth, Dee A.; and Luca, Vincent A., Jr., 4,464,000, Cl. 339-89.00M.
Winner, Joe K., 4,464,653, Cl. 340-501.000.

Benhase, Michael T.; and Duke, Alan H., to International Business Machines Corporation. Method and apparatus for converting addresses of a backing store having addressable data storage devices for accessing a cache attached to the backing store. 4,464,713, Cl. 364-200.000.

Benoit, Gordon L.; Donaldson, Jack J.; and Heilman, Paul D., to Mobil Oil Corporation. Method of preparing a thermoplastic bag having reinforced handles. 4,464,157, Cl. 493-211.000.

Benoit, Philippe: *See*—
Chielens, Alain; Benoit, Philippe; and Roggo, Bernard, 4,463,795, Cl. 164-455.000.

Bess, Edward F., Jr., to Clark Equipment Company. Industrial truck. 4,463,832, Cl. 187-9.00R.

Bentjens, Bernd, to Wilhelm Fette GmbH. Hob with cutting plates. 4,464,086, Cl. 407-25.000.

Beraud, Jean-Paul; and Galand, Claude, to International Business Machines Corporation. Transmission process and device for implementing the so-improved process. 4,464,782, Cl. 381-31.000.

Beraud, Jean-Paul; Esteban, Daniel J.; and Galand, Claude, to International Business Machines Corporation. Speech coding method and device for implementing the improved method. 4,464,783, Cl. 381-31.000.

Berg, Charles A., to Pyreflex Corp. Inhibiting shrinkage pipe formation of metal casting. 4,463,797, Cl. 164-492.000.

Berg, Peter G.; and Strobel, Stephen J., to Texas Instruments Incorporated. Fuel system having gasket heater. 4,463,737, Cl. 123-549.000.

Berg, Terje; Hubertz, Trond; Kleiven, Erland; and Torblaa, Ivar, to Ingenior A.B. Berdal A/S; Ingenior Thor Furuholmen A/S; and Sivilingenior Nybro Hansen A/S. System for undersea recovery of hydrocarbons. 4,463,987, Cl. 299-2.000.

Berger, Michel; and Schaeffner, Pierre, to Societe Civile Des Composites Electrolytiques. Anodes of composite materials and accumulators using solid anodes. 4,464,446, Cl. 429-190.000.

Berger, Rolf; Bonnen, Josef; Haffmans, Josef; Schafer, Max; Teetz, Wolfgang; and Gierse, Franzjosef. Shuttle embroidery machine. 4,463,692, Cl. 112-102.000.

Bergk, Gunther: *See*—
Schwarz, Gerhard E.; and Bergk, Gunther, 4,464,619, Cl. 320-40.000.

Bergqvist, Lars K., to Saab-Scania Aktiebolag. Method and an apparatus for remote control of a vehicle or a mobile engine. 4,464,659, Cl. 340-825.700.

Bergwerksverband GmbH: *See*—
Hodek, Werner, 4,464,245, Cl. 208-10.000.

Berkshire, Jon B.: *See*—
Scheible, Howard G.; and Berkshire, Jon B., 4,463,891, Cl. 228-180.00R.

Berzin, Evgeny K.: *See*—
Yantovsky, Leonid I.; Miroshnichenko, Anatoly G.; and Berzin, Evgeny K., 4,464,617, Cl. 318-717.000.

Besson, Raymond J. C.; and Maitre, Pierre C., to L'Etat Francais. Piezoelectric resonator with "drawer" . 4,464,598, Cl. 310-344.000.

Bettcher Industries, Inc.: *See*—
Bettcher, Louis A., 4,463,643, Cl. 83-703.000.

Bettcher, Louis A., to Bettcher Industries, Inc. Product pusher for cutting apparatus. 4,463,643, Cl. 83-703.000.

Betz Entec, Inc.: *See*—
O'Leary, Richard P., 4,464,315, Cl. 261-110.000.

Betzing, Hans; and Leyck, Sigurd, to A. Nattermann & Cie GmbH. Indol acetic acid derivatives and anti-inflamatory and related uses thereof. 4,464,379, Cl. 424-263.000.

Bezer, Christian; and Rouet, Michel, to Commisaariat a l'Energie Atomique. Transfer and positioning apparatus for the irradiation of targets. 4,464,331, Cl. 376-202.000.

Bhaduri, Saumya; and Demchick, Paul H., to United States of America, Agriculture. Simple and rapid method for extraction of proteins from bacteria. 4,464,295, Cl. 260-112.00R.

Bhatia, Harsaran S.; and Riseman, Jacob, to International Business Machines Corporation. Method for making high sheet resistivity resistors. 4,464,212, Cl. 148-187.000.

Bianco, Anthony F., Jr. Apparatus for shaping precious metals. 4,463,494, Cl. 30-90.400.

Biersack, Horst, to Crones & Co. GmbH. Cutter wheel for brush chipper. 4,463,907, Cl. 241-92.000.

Bilas, Michael. Reversible portable hoist. 4,463,858, Cl. 212-176.000.

Billard, Alain, to Etienne Lacroix Tous Artifices SA. High power pyrotechnic flare. 4,463,679, Cl. 102-336.000.

Bingham, Clark. Method for tertiary recovery of oil. 4,463,805, Cl. 166-248.000.

Binninger, August; and Kieliger, Josef, to Sulzer Brothers, Ltd. Pick-finding device for a weaving machine. 4,463,781, Cl. 139-1.00E.

Bird, Alfred J.; and King, Frank, to Johnson Matthey Public Limited Company. Three dimensional interstitial catalyst support and its manufacture. 4,464,482, Cl. 502-325.000.

Bird, David L., to International Business Machines Corporation. Test-case generator with marker symbols displayed with primary data. 4,464,655, Cl. 340-715.000.

Bird, James M.: *See*—
Lerwill, William E., 4,463,825, Cl. 181-113.000.

Bird Machine Company, Inc.: *See*—
Cummings, John R., 4,464,162, Cl. 494-53.000.

Bisagni, Emile; Dubertret, Louis; Moron, Jacqueline; Averbeck, Dietrich; Papadopoulo, Dora; Blais, Jocelyne; Vigny, Paul; Schwencke,

Maria N.; Moustacchi, Ethel; Nocentini, Silvano; and Zajdela, Francois, to Institut National de la Sante et de la Recherche Medicale. (3,4-c)-Pyrido psoralens, process of preparation, application in cosmetology and therapeutics, and cosmetological and pharmaceutical composition with them. 4,464,354, Cl. 424-59.000.

Bittler, Dieter; Laurent, Henry; Weichert, Rudolf; Casals-Stenzel, Jorge; and Schillinger, Ekkehard, to Schering Aktiengesellschaft. 6β,7β-Methylene-17α-pregn-4-ene-21,17-carbolactones, their preparation and use as medicinal agents. 4,464,364, Cl. 424-241.000.

Bixby, Guy T.: *See*—
Wink, Clifford W.; and Bixby, Guy T., 4,463,779, Cl. 138-125.000.

Blais, Jocelyne: *See*—
Bisagni, Emile; Dubertret, Louis; Moron, Jacqueline; Averbeck, Dietrich; Papadopoulo, Dora; Blais, Jocelyne; Vigny, Paul; Schwencke, Maria N.; Moustacchi, Ethel; Nocentini, Silvano; and Zajdela, Francois, 4,464,354, Cl. 424-59.000.

Blanchard, Jean; and Panak, Edouard. Anti-thrombotic therapeutic compositions. 4,464,377, Cl. 424-256.000.

Blankenship, Bernard F., to Basic Packaging Systems, Inc. Bag with closed valve. 4,464,790, Cl. 383-37.000.

Blecher, Jacob B., to Instrumentation Laboratory Inc. Sample handling apparatus. 4,463,616, Cl. 73-864.110.

Bledsoe, Gary R. Stabilizing knee hinge. 4,463,751, Cl. 128-80.00C.

Blekhman, Ilya I.: *See*—
Ivanov, Nikolai A.; Ivanov, Boris G.; Zagoratsky, Leonid P.; Mitrofanov, Evgeny S.; Cherkassky, Vladimir A.; Finkelshtein, Georgy A.; Blekhman, Ilya I.; Barzukov, Oleg P.; Kaljunov, Gennady A.; Khinich, Isaak Y.; and Turkin, Vladimir Y., 4,463,908, Cl. 241-207.000.

Bliesner, Jurgen: *See*—
Grossman, Kurt; and Bliesner, Jurgen, 4,464,010, Cl. 339-272.00R.

Bloom, Stanley, to RCA Corporation. CRT with quadrupolar-focusing color-selection structure. 4,464,601, Cl. 313-403.000.

Bloys, David W. Wood assembly stapling and bonding apparatus. 4,463,887, Cl. 227-7.000.

Bob Allen Companies, Inc., The: *See*—
Gordon, Stuart P., 4,463,847, Cl. 206-205.000.

Bobrik, Mikhail Y.: *See*—
Surovikin, Vitaly F.; Antonenko, Vladimir F.; Babich, Gennady V.; Bobrik, Mikhail Y.; Korenyak, Nikolai K.; Novikov, Vasily V.; Voloshin, Gennady A.; Belyaev, Georgy A.; Gordeev, Alexandr V.; Gallyamov, Nail I.; and Krikunenko, Anatoly F., 4,464,314, Cl. 261-79.00A.

Bock Products, Inc.: *See*—
Weber, Randall W.; and Weber, Charles A., 4,464,016, Cl. 350-289.000.

Bockhorst, Rhea W.: *See*—
Zimmerman, Wiley E.; Alexander, Jimmy R.; Boles, Don E.; and Bockhorst, Rhea W., 4,464,564, Cl. 219-497.000.

Boden, John C.; and Pratley, Gerald, to British Petroleum Company Limited, The. Flare using a Coanda director surface. 4,464,110, Cl. 431-350.000.

Boden, Richard M.; Tyszkiewicz, Theodore J.; and Watkins, Hugh, to International Flavors & Fragrances Inc. Organoleptic uses of phenyl ethyl methyl carbonate mixtures. 4,464,280, Cl. 252-174.110.

Bodlaj, Viktor, to Siemens Aktiengesellschaft. Method for correcting a measuring signal. 4,464,053, Cl. 356-376.000.

Boe, Ove S., to Danfoss A/S. Electrode arrangement for an oil or gas burner. 4,464,107, Cl. 431-264.000.

Boeing Company, The: *See*—
Ball, William H., 4,463,772, Cl. 137-15.200.
Gorges, Friedrich J.; and Hodges, Robert V., 4,463,774, Cl. 137-81.100.
McDowell, Leon H.; Weber, Roger E.; and Schmieder, Daniel J., 4,463,605, Cl. 73-432.0SD.
Pogson, John T.; Shannon, Roger L.; Hamasaki, Robert H.; Franklin, James L.; Watkins, Dale F.; and Kramer, Ted J., 4,463,798, Cl. 165-1.000.

Bogden, Dennis M., to General Motors Corporation. Engine sync pulse generator for a fuel injection system. 4,463,728, Cl. 123-475.000.

Boisseuil, Lucien; Luciani, Pierre; and Merard, Rene , to Commissariat a l'Energie Atomique. Device for controlling the dimensions and spaced apart relationship of rigid pieces disposed in a bundle. 4,464,332, Cl. 376-215.000.

Boles, Don E.: *See*—
Zimmerman, Wiley E.; Alexander, Jimmy R.; Boles, Don E.; and Bockhorst, Rhea W., 4,464,564, Cl. 219-497.000.

Bollag, Werner, to Hoffmann LaRoche Inc. Compositions and methods for using 13-cis vitamin A acid compounds. 4,464,394, Cl. 424-317.000.

Bomberger, Werner, to GIBA AG Gesellschaft fur Industrialisierung in Bauwesen. Assembly of casing elements for pouring of concrete. 4,463,926, Cl. 249-47.000.

Bonnen, Josef: *See*—
Berger, Rolf; Bonnen, Josef; Haffmans, Josef; Schafer, Max; Teetz, Wolfgang; and Gierse, Franzjosef, 4,463,692, Cl. 112-102.000.

Booz, A. Daivd: *See*—
Ramser, Robert A.; Booz, A. Daivd; Barch, Daniel R.; and Cebulak, Walter S., 4,464,103, Cl. 425-7.000.

Borel, Georg, to Hermann Wangaer GmbH & Co., KG. Shedding apparatus for circular weaving of multi-harness fabrics and method of using the apparatus. 4,463,782, Cl. 139-55.100.

Borer, Rene; Gerecke, Max; and Kyburz, Emilio, to Hoffmann-La Roche Inc. Triazolo benzazepines. 4,464,300, Cl. 260-245.500.

Borg, Sidney: *See*—
Lynch, Joseph M.; Pfafflin, James R.; Pecker, Calman; Cardenas, Raul; Cunningham, Seamus; Bozzone, Richard T., Sr.; and Borg, Sidney, 4,464,257, Cl. 210-195.100.

Borg-Warner Corporation: *See*—
Kern, John M., 4,464,152, Cl. 474-245.000.

Borho, Martin A.: *See*—
Friedman, Evelyn; Borho, Martin A.; Carswell, William R.; and Kecseti, Frank, 4,463,874, Cl. 221-238.000.

Borinelli, Enrico; and Buhler, Karl, to BBC Brown, Boveri & Company, Limited. Lifting and swivelling device. 4,463,857, Cl. 212-166.000.

Borschneck, Anthony G. Traction device. 4,463,750, Cl. 128-75.000.

Bosse, Dieter; Wingen, Rainer; Horn, Klaus; and Lutz, Walter, to Hoechst Aktiengesellschaft. 10-Phenyl-1,3,9-triazaanthracenes and photopolymerizable mixture containing same. 4,464,457, Cl. 430-288.000.

Bost, Gretchen L.; and Powell, Hampton O., to Lane Company, Inc., The. Smolder-resistant upholstery. 4,463,464, Cl. 5-459.000.

Bouck, Larry S.; Ozey, Erhan; and Worsham, Richard E., to Cities Service Co. Horizontal heated plane process. 4,463,988, Cl. 299-2.000.

Boudigues, Serge, to Office National d'Etudes et de Recherches Aerospatiales. Turbojet with contrarotating wheels. 4,463,553, Cl. 60-268.000.

Boudreaux, Gordon J.: *See*—
Bailey, August V.; Boudreaux, Gordon J.; and Sumrell, Gene, 4,464,392, Cl. 424-313.000.

Boudreaux, Mark J. Shaft immobilizer apparatus. 4,464,127, Cl. 440-74.000.

Boulton, Thomas W., to Imperial Chemical Industries PLC. Electrode structure for use in electrolytic cell. 4,464,242, Cl. 204-253.000.

Bourke, Eleanor F.: *See*—
Edelson, Richard L., 4,464,166, Cl. 604-6.000.

Bourke, Frederic A., Jr.: *See*—
Edelson, Richard L., 4,464,166, Cl. 604-6.000.

Bourret, Steven C.; and Swansen, James E., to United States of America, Energy. Stepping motor controller. 4,464,616, Cl. 318-696.000.

Bowles Fluidics Corporation: *See*—
Bray, Harry C., Jr., 4,463,904, Cl. 239-284.00R.

Bowyer, John T., to Hardy Spicer Limited. Constant velocity ratio universal joint. 4,464,143, Cl. 464-146.000.

Boyce, Bernard W.: *See*—
Willis, Jeffrey D.; Griffin, Arthur B.; and Boyce, Bernard W., 4,463,568, Cl. 60-742.000.

Boyesen, Eyvind, to Performance Industries, Inc. Drive wheel suspension system for motorcycle. 4,463,824, Cl. 180-227.000.

Bozzone, Richard T., Sr.: *See*—
Lynch, Joseph M.; Pfafflin, James R.; Pecker, Calman; Cardenas, Raul; Cunningham, Seamus; Bozzone, Richard T., Sr.; and Borg, Sidney, 4,464,257, Cl. 210-195.100.

Brammer, Hartmut, to Robert Bosch GmbH. Otto engine ignition pulse generator and distributor. 4,463,715, Cl. 123-146.50A.

Brandis, Helmut; Spyra, Wolfgang; and Reismann, Josef. Nickel/iron casting alloy exhibiting high strength at elevated temperatures and high microstructural stability. 4,464,335, Cl. 420-584.000.

Brauer, Eric A., to RCA Corporation. Stylus cleaner pad orientation in disc record player. 4,464,742, Cl. 369-71.000.

Braun Aktiengesellschaft: *See*—
Schwarz, Gerhard E.; and Bergk, Gunther, 4,464,619, Cl. 320-40.000.

Bray, Harry C., Jr., to Bowles Fluidics Corporation. Cold weather fluidic fan spray devices and method. 4,463,904, Cl. 239-284.00R.

Brazier, John R.: *See*—
Tack, Robert D.; Lewtas, Kenneth; and Brazier, John R., 4,464,182, Cl. 44-62.000.

Breithaupt, Albert, to Trube & Kings KG. Flame-viewing window assembly. 4,463,530, Cl. 52-171.000.

Bremer, Gordon, to Paradyne Corporation. System for generation of multiple pointed QAM signal spaces by use of synchronous Qam transmitters. 4,464,767, Cl. 375-67.000.

Brennek, Jerzy: *See*—
Milewski, Witold; Brennek, Jerzy; Stanikowski, Lech; Kunicki, Wojciech; Sapiezynski, Wieslaw; Konopczynski, Andrzej; and Kondratowicz, Zbigniew, 4,464,414, Cl. 427-37.000.

Bressler, Glenn O.; and Godshalk, James B., to Ultra-Mold Corporation. Method for training breeder hens and nest installation therefor. 4,463,705, Cl. 119-45.00R.

Brew, James K., to Dayco Corporation. Covered V-belt having reduced coefficient of friction sides. 4,464,153, Cl. 474-270.000.

Brewer, Arthur D., to Uniroyal Ltd. Method of synthesizing dihydro-1,4-dithiins. 4,464,538, Cl. 549-20.000.

Brewer, Michael W.: *See*—
Shorter, John J.; Woolnough, Victor J.; and Brewer, Michael W., 4,463,459, Cl. 3-30.000.

Brian D. Willis, P.C.: *See*—
Willis, Brian D., 4,463,470, Cl. 15-167.00R.

Bridge, Dan: *See*—
Hillier, Edward; Graybill, Larry; Winders, Richard; Bridge, Dan; and Dauchy, Joe, 4,464,081, Cl. 405-128.000.

Bridges, David B.; and Schulte, John J., to General Motors Corporation. Ignition distributor shaft coupler. 4,464,142, Cl. 464-92.000.

Briefer, Dennis K., to Setra Systems, Inc. Temperature compensated measuring system. 4,464,725, Cl. 364-571.000.

Briese, Wolfgang, to International Standard Electric Corporation. Piezoelectric resonator with integrated capacitances. 4,464,599, Cl. 310-348.000.

Bright, Gene M., to Pfizer Inc. Antibacterial 9-deoxo-9a-alkyl-9a-aza-9a-homoerythromycin A derivatives and intermediates therefore. 4,464,527, Cl. 536-7.400.

Brissette, Ronald N.; and Kumbier, Richard L., to Rockwell International Corporation. Center bearing assembly. 4,463,993, Cl. 308-184.00R.

Bristol, James A.; and Lovey, Raymond G., to Schering Corporation. Imidazo[1,2-b]pyridazines. 4,464,372, Cl. 424-250.000.

Bristol-Myers Company: *See*—
Hatori, Masami; Ohkuma, Hiroaki; Konishi, Masataka; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,464,467, Cl. 435-119.000.

British Petroleum Company Limited, The: *See*—
Boden, John C.; and Pratley, Gerald, 4,464,110, Cl. 431-350.000.

Broadbent, Scott G.: *See*—
Baer, Ted A.; and Broadbent, Scott G., 4,464,307, Cl. 260-544.00N.

Bron Electronic AG: *See*—
Nunsli, Armin; and Hauser, Hans-Peter, 4,464,708, Cl. 362-300.000.

Brooksby, Brian T.: *See*—
Simpson, Anthony; Peterkin, Stuart M.; and Brooksby, Brian T., 4,464,115, Cl. 434-27.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Sakakibara, Kenji, 4,464,071, Cl. 400-144.200.

Broun, Georges: *See*—
Avrameas, Stratis; Broun, Georges; Selegny, Eric; and Thomas, Daniel, 4,464,468, Cl. 435-177.000.

Brown, Clyde O.; and Smith, David C., to United Technologies Corporation. Isolator for high power radiation. 4,464,021, Cl. 350-354.000.

Brown, E. Vernon, Jr., to Glacier Products, Inc. Soft ice cream machine. 4,463,572, Cl. 62-135.000.

Brown, Graydon L.; and Newlin, Larry L., to Conoco Inc. Apparatus for detection and analysis of uranium ores. 4,464,568, Cl. 250-253.000.

Brown, Harry W., to Arinc Research Corporation. Shaft coupling. 4,464,141, Cl. 464-75.000.

Brown, Ralph V., to Facet Enterprises, Inc. Blocking oscillator for a reciprocating electromagnetic actuator. 4,464,613, Cl. 318-119.000.

Brown, Randall J., to B. F. Goodrich Company, The. Smoke retardant vinyl halide polymer compositions. 4,464,495, Cl. 524-87.000.

Brown, Ronald D.: *See*—
Armentrout, Richard W.; and Brown, Ronald D., 4,464,471, Cl. 435-253.000.

Brown, Thomas A.: *See*—
Peil, William; Brown, Thomas A.; and Harris, James E., 4,464,607, Cl. 315-209.00R.

Brownell, Peter, to Fram Corporation. Pleated filter element and integral shield and method for making same. 4,464,263, Cl. 210-484.000.

Brunone, William T.; Mode, Duane; and Russell, Michael R., to Champion International Corporation. Replaceable lid for flanged trays. 4,463,893, Cl. 229-43.000.

Brunswick Corporation: *See*—
Fitzner, Arthur O., 4,463,743, Cl. 123-599.000.
Puryear, John W., 4,463,914, Cl. 242-84.10J.
Puryear, John W., 4,463,916, Cl. 242-84.20A.

BS&B Safety Systems, Inc.: *See*—
Mundt, Arnold L.; and Nguyen, Gioan, 4,463,865, Cl. 220-89.00A.

Bubik, Alfred; Kummer, Oskar; and Rosenberg, Burkard, to Bell Maschinenfabrik AG. Method and machine for fabricating building boards. 4,464,225, Cl. 162-181.600.

Buchert, Janusz M.: *See*—
Alfano, Robert R.; and Buchert, Janusz M., 4,464,761, Cl. 372-41.000.

Buckley, Edward M.; Druke, Michael B.; and March, Roger W., to Data General Corporation. Frequency synthesizer for providing a pseudo-constant frequency signal. 4,464,772, Cl. 377-47.000.

Buckner, Stephen W.: *See*—
Lee, John R.; and Buckner, Stephen W., 4,463,738, Cl. 123-552.000.

Buddy L Corporation: *See*—
Crosman, Dorland L., 4,463,520, Cl. 446-443.000.
Hayes, Thomas J., 4,463,519, Cl. 446-443.000.

Buffalo Color Corp.: *See*—
Nagpal, Krishen L., 4,464,387, Cl. 424-273.00R.

Buhler, Karl: *See*—
Borinelli, Enrico; and Buhler, Karl, 4,463,857, Cl. 212-166.000.

Buhrer, Carl F., to GTE Laboratories Incorporated. Method of charging a vessel with mercury. 4,464,133, Cl. 445-9.000.

Bullis, Robert H.; DiDomenico, Robert A.; Kimberley, John A.; McHugh, Thomas M.; Parent, Christopher A.; Voss, James R.; and Wiegand, Walter J., to AMBAC Industries, Incorporated. Method and apparatus for controlling fuel injection timing in a compression ignition engine. 4,463,729, Cl. 123-478.000.

Bunce, Arthur; and Johanson, John E., deceased (by Johanson, Edna L., executrix), to Johanson Manufacturing Corporation. Shock proof adjustable low-loss capacitor. 4,464,699, Cl. 361-296.000.

Bunger, Heinrich; Cordes, Rudolf; and Hoffmann, Gerhard, to Dynamit Nobel Aktiengesellschaft. Process for the recovery and reuse of heavy metal oxidation catalyst from residues in the Witten DMT process. 4,464,477, Cl. 502-24.000.

Burba, John L., III, to Dow Chemical Company, The. Selective extraction of cobalt from ores. 4,464,348, Cl. 423-150.000.

Burger, Kurt; Friedrich, Heinz; Gruner, Heiko; Linn, Karl-Otto; and Zabler, Erich, to Robert Bosch GmbH. Controlled temperature coefficient thin-film circuit element. 4,464,646, Cl. 338-25.000.

Burmeister, Lewis H., to W. P. Dawson, Inc. Automatic kiln control. 4,464,548, Cl. 200-33.00R.

Burnett, Dale E.; Butts, Mervin R.; and Trissel, Paul E., to General Motors Corporation. Solid state clutch cycler with charge protection. 4,463,576, Cl. 62-228.300.

Burroughs Corporation: *See*—
Andresdakis, Nicholas C., 4,464,135, Cl. 445-25.000.
Cusack, Michael D.; and Turnbaugh, Kenneth B., 4,463,892, Cl. 228-212.000.

Burroughs Wellcome Co.: *See*—
Lennox, John C., Jr.; McAllister, Warren A.; and Mason, Donald L., 4,464,340, Cl. 422-103.000.

Busch, Lloyd E.: *See*—
Myers, Virginia K.; McKay, Bill E., Jr.; and Busch, Lloyd E., 4,464,250, Cl. 208-120.000.

Bush, J. Finley, to Aluminum Company of America. Recovery of aluminum from spent liquor. 4,464,347, Cl. 423-112.000.

Butcher, Roger A.; and Debard, Andre, to Aerosol Inventions and Development S.A. AIDSA. Valve assembly for pressurized dispensers. 4,463,784, Cl. 141-20.000.

Butler, John D., to Federal-Mogul Corp. Method of making a seal. 4,464,322, Cl. 264-138.000.

Butler, Stanley A., to Crane Packing Limited. Mechanical face seals. 4,463,958, Cl. 277-84.000.

Butters, Scott W.: *See*—
Stoddard, Nyle S.; and Butters, Scott W., 4,463,602, Cl. 73-153.000.

Butts, Mervin R.: *See*—
Burnett, Dale E.; Butts, Mervin R.; and Trissel, Paul E., 4,463,576, Cl. 62-228.300.

Buzza, Edmund E., to Beckman Instruments, Inc. Liquid transfer valve. 4,463,615, Cl. 73-863.320.

Cabot Corporation: *See*—
Kumar, Prabhat; Rivers, Ronald D.; and Hickl, Anthony J., 4,464,205, Cl. 148-11.50P.
Kumar, Prabhat; Rivers, Ronald D.; and Hickl, Anthony J., 4,464,206, Cl. 148-11.50P.

Calderon, Albert. Method for making iron by induction heating. 4,464,197, Cl. 75-11.000.

Caldwell, Donald L.; and Poush, Kenneth A., to Dow Chemical Company, The. Porous separators for electrolytic processes. 4,464,238, Cl. 204-98.000.

Campbell, Edward F., Jr.: *See*—
Fuller, Berkeley; Soll, Linda; Obrecht, Margretta; Poole, Gary; Campbell, Edward F., Jr.; Parsons, Margaret; Chun, Valerie P. P.; Shearer, David R.; and Cashman, Thomas M., 4,464,122, Cl. 434-262.000.

Camps, Edilia: *See*—
Rapisarda, Anthony; Camps, Edilia; and Bauer, Herbert, 4,464,281, Cl. 252-174.210.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Plante, Joseph L. P.; Kluchert, Rolf E.; and St-Onge, Joseph C. M., 4,464,131, Cl. 441-29.000.

Canon Kabushiki Kaisha: *See*—
Fujino, Masahisa; Sunouchi, Akio; Konno, Tatsuo; and Suzuki, Ryuji, 4,464,033, Cl. 354-266.000.
Iwashita, Tomonori; and Mashimo, Yukio, 4,464,031, Cl. 354-173.100.
Kajita, Isamu; and Sumino, Fumio, 4,464,449, Cl. 430-54.000.
Kato, Masatake; and Hashimoto, Shigeru, 4,464,023, Cl. 350-464.000.
Kiuchi, Masayoshi; Uchidoi, Masanori; and Urushihara, Kazunobu, 4,464,032, Cl. 354-234.100.
Koumura, Noboru; Komatsu, Toshiyuki; Nakagawa, Katsumi; Takekawa, Nobuhiro; and Fujii, Motoharu, 4,464,043, Cl. 355-14.00C.
Nakamura, Zenzo; Uchiyama, Takashi; Ohtaki, Shohei; Tsunekawa, Tokuichi; Uchidoi, Masanori; and Mashimo, Yukio, 4,464,609, Cl. 315-241.00P.
Nozaki, Mineo; Ozawa, Toshiaki; Asakura, Osamu; Kondo, Hiroatsu; and Okamura, Shigera, 4,463,672, Cl. 101-93.090.
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,464,451, Cl. 430-65.000.
Yamada, Yasuaki; Ozawa, Toshiaki; and Kondo, Hiroatsu, 4,464,069, Cl. 400-83.000.
Yamada, Yu, 4,464,024, Cl. 350-465.000.
Yoshida, Shigeru; and Kawai, Yasuo, 4,464,692, Cl. 360-133.000.

Canusa Coating Systems Limited: *See*—
Hansen, Ralph H., 4,464,240, Cl. 204-159.200.

Caoutchouc Manufacture et Plastiques: *See*—
Bac, Jean-Claude, 4,463,919, Cl. 244-134.00A.

Capetanopoulos, Constantine: *See*—
Owens, Roger W.; Hickey, Robert F.; and Capetanopoulos, Constantine, 4,464,262, Cl. 210-291.000.

Cappuccilli, Giorgio, to Tycon S.p.A. Probe terminal for temperature measuring in enamelled reactors. 4,464,066, Cl. 374-141.000.

Carasso, Marino G.: *See*—
Huijser, Arie; Carasso, Marino G.; and Verboom, Johannes J., 4,464,714, Cl. 364-200.000.

Carbon, John A.; and Clarke, Louise B., to University of California, The Regents of the. Construction and use of functional minichromosomes. 4,464,472, Cl. 435-255.000.

Cardenas, Raul: *See*—
Lynch, Joseph M.; Pfafflin, James R.; Pecker, Calman; Cardenas, Raul; Cunningham, Seamus; Bozzone, Richard T., Sr.; and Borg, Sidney, 4,464,257, Cl. 210-195.100.

Carl Freudenberg, Firma: *See*—
Ebert, Heinrich; Noe, Manfred; Wind, Kurt; and Kirsch, Wilhelm, 4,464,428, Cl. 428-95.000.

Carpenter, Francis W., III: *See*—
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Hudson, Wilbur G.; Webb, Tommy W.; Phillips, William S.; Tompa, Thomas J.; and Sanders, Edward, Jr., 4,463,669, Cl. 100-43.000.

Carpenter, John R.: *See*—
Leshik, Richard R.; Iyer, Bala S.; and Carpenter, John R., 4,464,403, Cl. 426-271.000.

Carroll, Noel. Cyclone separator. 4,464,264, Cl. 210-512.100.

Carru, Jean-Pierre: *See*—
Baudoin, Michel; Carru, Jean-Pierre; and Veislinger, Yves, 4,464,542, Cl. 179-2.00C.

Carsello, Anthony; and Michel, James J., to Allegretti & Company. Edger. 4,463,544, Cl. 56-17.100.

Carswell, William R.: *See*—
Friedman, Evelyn; Borho, Martin A.; Carswell, William R.; and Kecseti, Frank, 4,463,874, Cl. 221-238.000.

Casals-Stenzel, Jorge: *See*—
Bittler, Dieter; Laurent, Henry; Weichert, Rudolf; Casals-Stenzel, Jorge; and Schillinger, Ekkehard, 4,464,364, Cl. 424-241.000.

Cashman, Thomas M.: *See*—
Fuller, Berkeley; Soll, Linda; Obrecht, Margretta; Poole, Gary; Campbell, Edward F., Jr.; Parsons, Margaret; Chun, Valerie P. P.; Shearer, David R.; and Cashman, Thomas M., 4,464,122, Cl. 434-262.000.

Casino Technology: *See*—
Fish, Leonard A.; and Hanger, Thomas, 4,464,787, Cl. 382-7.000.

Casio Computer Co., Ltd.: *See*—
Mitarai, Tsuyoshi, 4,463,646, Cl. 84-1.010.

Cassou, Bertrand: *See*—
Cassou, Robert; Cassou, Bertrand; and Cassou, Maurice, 4,463,707, Cl. 119-97.00R.

Cassou, Maurice: *See*—
Cassou, Robert; Cassou, Bertrand; and Cassou, Maurice, 4,463,707, Cl. 119-97.00R.

Cassou, Robert; Cassou, Bertrand; and Cassou, Maurice. Apparatus for presenting animals, especially poultry, for artificial insemination operations. 4,463,707, Cl. 119-97.00R.

Castelein, Jean, to Montefina S.A. Co-extruded laminate consisting of at least one sheet of polypropylene and at least one sheet of polymeric material based on high-impact polystyrene. 4,464,439, Cl. 428-517.000.

Cavazza, Claudio, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Use of alkanoyl L-carnitines in the therapeutical treatment of myopathies and muscular dystrophies. 4,464,393, Cl. 424-316.000.

Cebulak, Walter S.: *See*—
Ramser, Robert A.; Booz, A. Daivd; Barch, Daniel R.; and Cebulak, Walter S., 4,464,103, Cl. 425-7.000.

Cecil, Waldo E., to Meritex Plastic Inc. Protective enclosure for electronic devices. 4,463,851, Cl. 206-328.000.

Celanese Corporation: *See*—
Davis, Danny A., 4,464,434, Cl. 428-402.220.

Celette, Germain, to Celette S.A. Apparatus for a gauge block for the inspection and/or repair of motor vehicle bodyworks. 4,463,937, Cl. 269-17.000.

Celette S.A.: *See*—
Celette, Germain, 4,463,937, Cl. 269-17.000.

Cengel, John A.: *See*—
Cousineau, Thomas J.; and Cengel, John A., 4,464,277, Cl. 252-56.00S.

Center Art Galleries: *See*—
Shafer, David R., 4,464,015, Cl. 350-138.000.

Cera, Thomas J.; and Price, Charles A., to United States Steel Corporation. Apparatus and method for the control of the precoating of an effluent filtration baghouse utilizing clean side pressure measurement. 4,464,184, Cl. 55-21.000.

Ceresa, Myron; Vyas, Frank N.; and Zimmerman, Richard H., to AMP Incorporated. Flame retardant preinsulated electrical connector. 4,464,541, Cl. 174-84.00C.

Cessna Aircraft Company, The: *See*—
Krehbiel, Robert D., 4,463,563, Cl. 60-593.000.

Chaki, Takao, to Clarion Co., Ltd. Crank mechanism in a pushbutton tuner. 4,463,619, Cl. 74-10.330.

Chamberlain, Harvey H.: *See*—
Wagner, James B.; and Chamberlain, Harvey H., 4,464,577, Cl. 290-40.00A.

Chambers, J. Bruce; and Paul, Donald D. Boat trailer. 4,464,092, Cl. 414-534.000.

Chambon, Michel, to Lucien Ferraz & Cie. Probe point device for electrical tests. 4,464,623, Cl. 324-72.500.

Champion International Corporation: *See*—
Brunone, William T.; Mode, Duane; and Russell, Michael R., 4,463,893, Cl. 229-43.000.

Chance, James M. Irrigation system. 4,464,079, Cl. 405-37.000.

Chas. A Blatchford & Sons Limited: *See*—
Shorter, John J.; Woolnough, Victor J.; and Brewer, Michael W., 4,463,459, Cl. 3-30.000.

Chartier, Michael S., to RCA Corporation. Digital gain control system. 4,464,723, Cl. 364-571.000.

Chauvier, Daniel J. V. D. Bumper for automatic swimming pool cleaning equipment. 4,463,468, Cl. 15-1.700.

Chemische Fabrik Kalk GmbH: *See*—
Taubert, Rainer; and Kerscher, Utto, 4,464,501, Cl. 524-410.000.

Chemlime Corporation: *See*—
Hains, Norman L., 4,464,353, Cl. 423-640.000.

Chen, Chin L., to International Business Machines Corporation. Two bit symbol SEC/DED code. 4,464,753, Cl. 371-38.000.

Chenausky, Peter P.; Mongeon, Robert J.; and Laughman, Lanny M., to United Technologies Corporation. Passively-Q-switched dual laser. 4,464,758, Cl. 372-11.000.

Cheng, Yung-Sung: *See*—
Yeh, Hsu-Chi; and Cheng, Yung-Sung, 4,463,595, Cl. 73-28.000.

Cherkassky, Vladimir A.: *See*—
Ivanov, Nikolai A.; Ivanov, Boris G.; Zagoratsky, Leonid P.; Mitrofanov, Evgeny S.; Cherkassky, Vladimir A.; Finkelshtein, Georgy A.; Blekhman, Ilya I.; Barzukov, Oleg P.; Kaljunov, Gennady A.; Khinich, Isaak Y.; and Turkin, Vladimir Y., 4,463,908, Cl. 241-207.000.

Cherry, Arthur R. Connectors for geodesic dome structures. 4,464,073, Cl. 403-170.000.

Chevallier, Gilbert: *See*—
Artaud, Robert; Aubert, Michel; Lemercier, Guy; Lambert, Paul; and Chevallier, Gilbert, 4,464,334, Cl. 376-298.000.

Chevron Research Company: *See*—
Spellmann, Richard A., 4,464,719, Cl. 364-300.000.

Chiang, Alice M., to Massachusetts Institute of Technology. Charge domain parallel processing network. 4,464,726, Cl. 364-606.000.

Chiba, Shu: *See*—
Sawazaki, Norikazu; and Chiba, Shu, 4,464,691, Cl. 360-111.000.

Chiba, Toshiyuki: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,464,369, Cl. 424-246.000.

Chielens, Alain; Benoit, Philippe; and Roggo, Bernard, to Fives-Cail Babcock. Method of cooling a continuous casting. 4,463,795, Cl. 164-455.000.

Chiesa, Peter J., Jr.; and Norman, Edward C., to Enterra Corporation. Preparing fire-fighting concentrates. 4,464,267, Cl. 252-8.050.

Chirino, Agustin M.: *See*—
Beall, George H.; Chirino, Agustin M.; Chyung, Kenneth; Martin, Francis W.; and Taylor, Mark P., 4,464,475, Cl. 501-9.000.

Cholin, Jeffrey G.: *See*—
Cholin, John M.; Cholin, Jeffrey G.; and Voorhis, Ray, 4,464,575, Cl. 250-554.000.

Cholin, John M.; Cholin, Jeffrey G.; and Voorhis, Ray, to Firetek Corporation. Test device for an optical infra red detector. 4,464,575, Cl. 250-554.000.

Chow, Ming-Fea; Fredericks, Edward C.; and Moreau, Wayne M., to International Business Machines Corporation. Process for forming resist masks utilizing O-quinone diazide and pyrene. 4,464,458, Cl. 430-312.000.

Christ, Eugene L.: *See*—
Rooney, Jack F.; Cooper, William K.; Papageorge, Stephen J.; and Christ, Eugene L., 4,463,804, Cl. 166-165.000.

Christensen, Inc.: *See*—
Jurgens, Rainer; and Krehl, Dietmar, 4,463,815, Cl. 175-302.000.

Christopfel, William C.; and Knowles, William S., to Monsanto Company. Coordination complexes of optically active phosphine compounds. 4,464,306, Cl. 260-429.00J.

Christophorou, Loucas G.: *See*—
Pace, Marshall O.; Adcock, James L.; and Christophorou, Loucas G., 4,464,417, Cl. 427-41.000.

Chun, Valerie P. P.: *See*—
Fuller, Berkeley; Soll, Linda; Obrecht, Margretta; Poole, Gary; Campbell, Edward F., Jr.; Parsons, Margaret; Chun, Valerie P. P.; Shearer, David R.; and Cashman, Thomas M., 4,464,122, Cl. 434-262.000.

Church, John G.; and Malone, Emerson G., to T.I.M.E. Welding Gas Corporation. Arc welding gun with gas diffuser and external cooling conduit. 4,464,560, Cl. 219-137.420.

Chyung, Kenneth: *See*—
Beall, George H.; Chirino, Agustin M.; Chyung, Kenneth; Martin, Francis W.; and Taylor, Mark P., 4,464,475, Cl. 501-9.000.

Ciba-Geigy Corporation: *See*—
Kramer, Hans; Zahir, Sheik A.; and Forster, Ewald, 4,464,486, Cl. 521-83.000.
Wehrli, Hansuli; Kocsis, Karoly; and Scartazzini, Riccardo, 4,464,366, Cl. 424-246.000.

CIP Inc.: *See*—
Matolcsy, Geza A., 4,464,224, Cl. 162-111.000.

Cities Service Co.: *See*—
Bouck, Larry S.; Ozey, Erhan; and Worsham, Richard E., 4,463,988, Cl. 299-2.000.

Citizen Watch Company Limited: *See*—
Hanaoka, Tadashi, 4,464,067, Cl. 374-170.000.

Clapsaddle, Charles. Flexible automobile screen. 4,463,790, Cl. 160-105.000.

Clarion Co., Ltd.: *See*—
Chaki, Takao, 4,463,619, Cl. 74-10.330.

Clark Equipment Company: *See*—
Bens, Edward F., Jr., 4,463,832, Cl. 187-9.00R.
Redzinski, Gilbert E., 4,463,842, Cl. 192-0.052.

Clark, Kim K., to Honeywell Inc. Prioritized sorting system. 4,464,732, Cl. 364-900.000.

Clark, Melville, Jr.: *See*—
Luce, David A., 4,463,647, Cl. 84-1.010.

Clarke, Louise B.: *See*—
Carbon, John A.; and Clarke, Louise B., 4,464,472, Cl. 435-255.000.

Clemens, A. H.; and Hough, David L., to Miles Laboratories, Inc. Blood glucose control apparatus and method. 4,464,170, Cl. 604-50.000.

Cleveland, William C., Jr.: *See—*
Sobczak, Isidore F.; Cleveland, William C., Jr.; and Poss, Robert L., 4,463,749, Cl. 126-451.000.
Cluxton, Charles N. K.: *See—*
Kagdis, William A., deceased, 4,464,785, Cl. 381-117.000.
Coachmen Industries, Inc.: *See—*
Irelan, John A., 4,463,982, Cl. 296-170.000.
Snyder, Steven A., 4,463,962, Cl. 280-164.00R.
Coash, Ronald J.: *See—*
Reinke, Richard F.; and Coash, Ronald J., 4,463,906, Cl. 239-720.000.
Coburn, John A., Jr.; and Shaw, Paul R., to L & L Products, Inc. Closure plate for an opening. 4,463,870, Cl. 220-307.000.
Cogliano, Joseph A., to W. R. Grace & Co. Process of applying a unitary construction barrier. 4,464,215, Cl. 156-71.000.
Cogswell, John; Fokos, Robert F.; and Alden, Dale E., to Special Products Engineering Corporation. Rotary cutting and alignment system for a printing press. 4,463,640, Cl. 83-116.000.
Cohn, Martin: *See—*
Eastman, Willard L.; Lempel, Abraham; Ziv, Jacob; and Cohn, Martin, 4,464,650, Cl. 340-347.0DD.
Cole-Hamilton, David J.: *See—*
Mullin, John B.; Holliday, Arthur K.; Cole-Hamilton, David J.; and Jones, Anthony C., 4,464,233, Cl. 204-59.0QM.
Colling, Joseph: *See—*
Mercatoris, Robert; Artois, Fernand; Colling, Joseph; and Feitler, Albert, 4,464,055, Cl. 366-26.000.
Collins, Gordon T., to Bendix Corporation, The. Coupling nut having an anti-decoupling device. 4,464,001, Cl. 339-90.00R.
Collura, Peter C.; Goda, Boyd D.; and Palagi, Harvey N., to Kliklok Corporation. Apparatus and method for forming and debowing cartons. 4,464,155, Cl. 493-137.000.
Colombo, Edward A.; and Sharps, Gordon V., Jr., to Mobil Oil Corporation. Vacuum seal bar. 4,464,219, Cl. 156-251.000.
Columbus McKinnon Corporation: *See—*
Schreyer, Kenneth D.; and Cooper, Alton H., 4,463,933, Cl. 254-368.000.
Colwell, Darrel R., to AT&T Technologies, Inc. Methods and apparatus for distilling a contaminated solvent. 4,464,227, Cl. 202-170.000.
Combustion Engineering, Inc.: *See—*
Wohlsen, William D., 4,464,333, Cl. 376-280.000.
Commissariat a l'Energie Atomique: *See—*
Artaud, Robert; Aubert, Michel; Lemercier, Guy; Lambert, Paul; and Chevallier, Gilbert, 4,464,334, Cl. 376-298.000.
Auchapt, Pierre; and Ferlay, Aime , 4,464,341, Cl. 422-202.000.
Bezer, Christian; and Rouet, Michel, 4,464,331, Cl. 376-202.000.
Boisseuil, Lucien; Luciani, Pierre; and Merard, Rene , 4,464,332, Cl. 376-215.000.
Compaan, Klaas, to U.S. Philips Corporation. Optical focusing-error detection device. 4,464,741, Cl. 369-45.000.
Compagnie Francaise des Isolants: *See—*
Monget, Pierre; and Naffrechoux, Etienne, 4,463,652, Cl. 87-1.000.
Compagnie Francaise des Petroles: *See—*
Durrieu, Marc M.; and Thery, Jean-Pierre, 4,464,057, Cl. 366-139.000.
Comparetto, John E. Peripheral fiberoptic contact lens. 4,464,026, Cl. 351-160.00R.
Condon, Chris J. Motion picture system for single strip 3-D filming. 4,464,028, Cl. 352-65.000.
Connaught Laboratories Limited: *See—*
Coursaget, Pierre L. J.; and Maupas, Philippe C., 4,464,474, Cl. 436-513.000.
Conoco Inc.: *See—*
Brown, Graydon L.; and Newlin, Larry L., 4,464,568, Cl. 250-253.000.
Zimmerman, Wiley E.; Alexander, Jimmy R.; Boles, Don E.; and Bockhorst, Rhea W., 4,464,564, Cl. 219-497.000.
Consiglio Nazionale Delle Ricerche: *See—*
Lazzari, Mario; and Scrosati, Bruno, 4,464,447, Cl. 429-194.000.
Conti, Mario W. Picture locking and straightening device. 4,463,924, Cl. 248-553.000.
Continental Plastics, Inc.: *See—*
Lewis, Duane H., 4,463,869, Cl. 220-307.000.
Contraves AG: *See—*
Schwager, Anton; and Suter, Hans-Jorg, 4,464,620, Cl. 323-300.000.
Control Data Corporation: *See—*
Schwarz, Edward L., 4,464,579, Cl. 290-44.000.
Cooper, Alton H.: *See—*
Schreyer, Kenneth D.; and Cooper, Alton H., 4,463,933, Cl. 254-368.000.
Cooper, Clifford W. Binocular trainer. 4,464,027, Cl. 351-203.000.
Cooper, Sidney; and Jacob, Ezekiel J., to Ani-Live Film Services, Inc. Dry transfer carrier sheets for use in an electrophotographic process. 4,464,453, Cl. 430-126.000.
Cooper, William K.: *See—*
Rooney, Jack F.; Cooper, William K.; Papageorge, Stephen J.; and Christ, Eugene L., 4,463,804, Cl. 166-165.000.
Copfer, Robert T. Fishing rod holder for ice fishermen. 4,463,511, Cl. 43-21.200.
Copley, Russell D.: *See—*
Hubbard, Arthur L.; Copley, Russell D.; and Reichen, Ronald L., 4,463,543, Cl. 56-44.000.
Copolymer Rubber & Chemical Corp.: *See—*
Joffrion, Ralph K., 4,464,493, Cl. 523-319.000.
Cordes, Rudolf: *See—*
Bunger, Heinrich; Cordes, Rudolf; and Hoffmann, Gerhard, 4,464,477, Cl. 502-24.000.
Cordin Corporation: *See—*
Gold, Philip, 4,463,765, Cl. 128-785.000.
Cormier, Thomas E.: *See—*
Agrawal, Rakesh; and Cormier, Thomas E., 4,464,188, Cl. 62-13.000.
Cornell-Dubilier Corp.: *See—*
Pitel, Ira J., 4,464,610, Cl. 315-291.000.
Corning Glass Works: *See—*
Beall, George H.; Chirino, Agustin M.; Chyung, Kenneth; Martin, Francis W.; and Taylor, Mark P., 4,464,475, Cl. 501-9.000.
Howell, Robert G., 4,464,421, Cl. 427-102.000.
Corona, Antonio; and Ho, Paul F., to Antonio Corona & Associates R & D Ltd. Multiple bit screwdriver. 4,463,788, Cl. 145-63.000.
Cortes, Pedro S.: *See—*
Ochoa, Pedro S.; and Cortes, Pedro S., 4,463,934, Cl. 256-13.100.
Corwith, John T.: *See—*
Hillstrom, Thomas P.; Wilson, Robert J.; and Corwith, John T., 4,464,604, Cl. 315-79.000.
Costa, Dominick: *See—*
Sodder, George, Jr.; and Costa, Dominick, 4,463,986, Cl. 299-1.000.
Courbot, Pierre, to Societe Anonyme D.B.A. Spring for disc brake. 4,463,837, Cl. 188-73.380.
Coursaget, Pierre L. J.; and Maupas, Philippe C., to Connaught Laboratories Limited. Non-A, non-B hepatitis assay and vaccine. 4,464,474, Cl. 436-513.000.
Courtney, Thomas F., Jr.: *See—*
Pittet, Alan O.; Vock, Manfred H.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,464,408, Cl. 426-535.000.
Cousineau, Thomas J.; and Cengel, John A., to Standard Oil Company (Indiana). Synthetic lubricant composition. 4,464,277, Cl. 252-56.00S.
Cox, David L.: *See—*
Fieldsteel, A. Howard; Cox, David L.; and Moeckli, Randolph A., 4,464,470, Cl. 435-253.000.
Cox, Michael T., to Imperial Chemical Industries PLC. Homocyclic derivatives. 4,464,358, Cl. 424-177.000.
Cox, Roger B.; and Steer, David C., to Lever Brothers Company. Microbial heteropolysaccharide. 4,464,410, Cl. 426-573.000.
Cramer, Barry G.: *See—*
Cramer, Roy A.; and Cramer, Barry G., 4,464,259, Cl. 210-219.000.
Cramer, Roy A.; and Cramer, Barry G., to Air-O-Lator Corporation. Hydraulic horizontal mixer. 4,464,259, Cl. 210-219.000.
Crane Packing Limited: *See—*
Butler, Stanley A., 4,463,958, Cl. 277-84.000.
Crawford, Leroy A.: *See—*
Jackson, Robert E.; Crawford, Leroy A.; and Webb, Bryant F., 4,463,668, Cl. 100-24.000.
Crigler, T. P. Greenhouse structures and methods for their construction. 4,463,534, Cl. 52-395.000.
Critikon, Inc.: *See—*
Glover, Wayne; and Medero, Richard, 4,464,123, Cl. 434-268.000.
McGaughey, John; McVay, W. Patrick; and Lauer, William, 4,464,177, Cl. 604-168.000.
Crone, Axel. Cap unit. 4,463,878, Cl. 222-153.000.
Crones & Co. GmbH: *See—*
Biersack, Horst, 4,463,907, Cl. 241-92.000.
Crosby Valve and Engineering Company, Limited: *See—*
Hewlett, Kelvin J., 4,463,776, Cl. 137-495.000.
Crosman, Dorland L., to Buddy L Corporation. Self-returning toy vehicle. 4,463,520, Cl. 446-443.000.
Crowley, Albert T.; and Lisowski, Robert M., to RCA Corporation. Universal digital frequency synthesizer using single side band techniques. 4,464,638, Cl. 331-1.00A.
Cseko, Christine: *See—*
Munteanu, Marina A.; Cseko, Christine; Oltarzewski, Edward S.; Lindauer, Jerome I.; and Withycombe, Donald A., 4,464,271, Cl. 252-8.600.
Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., to Multiform Desiccants, Inc. Adsorbent device. 4,464,261, Cl. 210-282.000.
Culver, Frank R., to Westinghouse Electric Corp. Power collection apparatus for a vehicle. 4,464,546, Cl. 191-49.000.
Cummings, John R., to Bird Machine Company, Inc. Centrifugal separator. 4,464,162, Cl. 494-53.000.
Cummins Engine Company, Inc.: *See—*
Perr, Julius P.; and Peters, Lester L., 4,463,901, Cl. 239-95.000.
Cunningham, Seamus: *See—*
Lynch, Joseph M.; Pfafflin, James R.; Pecker, Calman; Cardenas, Raul; Cunningham, Seamus; Bozzone, Richard T., Sr.; and Borg, Sidney, 4,464,257, Cl. 210-195.100.
Curley, John L.: *See—*
Keeley, James W.; Fisher, Edwin P.; and Curley, John L., 4,464,717, Cl. 364-200.000.
Curry, Cecil G. Telescoping prod. 4,463,981, Cl. 294-100.000.
Cusack, Michael D.; and Turnbaugh, Kenneth B., to Burroughs Corporation. Method for manufacturing IC packages. 4,463,892, Cl. 228-212.000.
Custom Tool, Inc.: *See—*
Barnes, James E.; Morkoetter, James G.; and Robbins, Norman M., 4,463,631, Cl. 81-3.10R.
Cuzic, John E.: *See—*
Stoesser, Paul R.; Cuzic, John E.; and McLaren, John W., 4,463,905, Cl. 239-329.000.

Cyborex Laboratories, Inc.: *See—*
Gurr, George P.; and Matheson, Frederick A., 4,464,724, Cl. 364-492.000.
Czajkowski, Stanislaw B., to Sonic Tape Public Limited Company. Sonar distance sensing apparatus. 4,464,738, Cl. 367-97.000.
Czibula, Laszlo : *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Kreidl, Janos; Nemes, Andras; Farkas nee Kirjak, Maria; Visky, Gyorgy; and Czibula, Laszlo , 4,464,534, Cl. 546-51.000.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Kreidl, Janos; Visky, Gyorgy; Nemes, Andras; Czibula, Laszlo ; and Farkas nee Kirjak, Maria, 4,464,535, Cl. 546-51.000.
Czvikovszky, Tibor J.; Pazonyi, Tamas; Topolcai, Laszlone I.; and Kleban, Janos, to Muanyagipari Kutato Intezet. Process for the preparation of a material of composite structure. 4,464,510, Cl. 525-54.230.
Daily, Virgil W., III: *See—*
Knuth, Henry A.; and Daily, Virgil W., III, 4,463,746, Cl. 126-25.00R.
Daines, John, to Mobil Oil Corporation. Method and mold for making an improved egg carton. 4,463,894, Cl. 229-44.0EC.
Dainippon Screen Seizo Kabushiki Kaisha: *See—*
Taniguchi, Hiroshi; Takita, Nobuhiro; Nomura, Norimasa; and Mizuta, Masaji, 4,464,036, Cl. 354-324.000.
Dais, William F.; and Malarz, Antoni J., to General Motors Corporation. Injector for molding hardenable liquid precursors. 4,463,881, Cl. 222-375.000.
Daisy Systems Corporation: *See—*
Stamm, David A., 4,464,715, Cl. 364-200.000.
Daiwa Seiko Inc.: *See—*
Kaneko, Kyoichi, 4,463,915, Cl. 242-84.20G.
Dalglish, Robert L., to Unisearch Limited. Charged particle beam focussing device. 4,464,573, Cl. 250-396.00R.
Dalton, Michael J. Method and apparatus for administration of fluids. 4,464,178, Cl. 604-174.000.
D'Ambro, Dominic: *See—*
Giangiulio, Clayton; and D'Ambro, Dominic, 4,464,109, Cl. 431-344.000.
Danfoss A/S: *See—*
Boe, Ove S., 4,464,107, Cl. 431-264.000.
Daniel, Michel: *See—*
Prigent, Hubert; Roudeau, Maurice; and Daniel, Michel, 4,464,621, Cl. 324-52.000.
Daniels, Roger S.: *See—*
Rodriquez, Daniel V.; and Daniels, Roger S., 4,463,537, Cl. 52-489.000.
Dantlgraber, Joerg; and Mueller, Albert, to Mannesmann Rexroth GmbH. Pressure responsive valve. 4,463,929, Cl. 251-44.000.
Dargel, William O.: *See—*
Sternberg, Stanley R.; Lougheed, Robert M.; and Dargel, William O., 4,464,788, Cl. 382-41.000.
Data General Corporation: *See—*
Buckley, Edward M.; Druke, Michael B.; and March, Roger W., 4,464,772, Cl. 377-47.000.
Young, Charles J., 4,464,716, Cl. 364-200.000.
Daubach, Ewald: *See—*
Belde, Horst; Hartmann, Eduard; and Daubach, Ewald, 4,464,203, Cl. 106-308.00N.
Dauchy, Joe: *See—*
Hillier, Edward; Graybill, Larry; Winders, Richard; Bridge, Dan; and Dauchy, Joe, 4,464,081, Cl. 405-128.000.
Davies, Norman; and Vaill, Ronald E., to Westinghouse Electric Corp. Metal clad switchgear having exterior ventilation shafts. 4,464,703, Cl. 361-342.000.
Davis, Danny A., to Celanese Corporation. Microencapsulated alkaloidal material and method of producing same. 4,464,434, Cl. 428-402.220.
Dawson, Marcia I., to SRI International. Esters of retinoic acid and pentaerythritol and monobenzal acetals thereof. 4,464,389, Cl. 424-278.000.
Day, Richard L., to Deere & Company. Windrow pickup mechanism. 4,463,546, Cl. 56-364.000.
Dayco Corporation: *See—*
Brew, James K., 4,464,153, Cl. 474-270.000.
Foster, Randy C., 4,464,147, Cl. 474-135.000.
De La Rue Giori SA: *See—*
Kaehfuss, Runwalt, 4,463,677, Cl. 101-426.000.
De La Rue Systems Limited: *See—*
Hilton, Graham H., 4,463,607, Cl. 73-587.000.
Dearman, Timothy C. Internal clamping of pipes. 4,463,938, Cl. 269-48.100.
Debard, Andre: *See—*
Butcher, Roger A.; and Debard, Andre, 4,463,784, Cl. 141-20.000.
De Christopher, Eugene L. Method for making pizza shells. 4,464,405, Cl. 426-391.000.
Decker, Robert W., to Sier-Bath Gear Company, Inc. Flexible couplings. 4,464,138, Cl. 464-56.000.
Deconinck, Hugo F., to Agfa-Gevaert N.V. Dispenser for dispensing photographic sheets from a stack. 4,463,943, Cl. 271-21.000.
Deere & Company: *See—*
Ahlschwede, Brian A.; and McKee, Kevin D., 4,463,628, Cl. 74-861.000.
Becker, Manfred; and Ortlepp, Hilmar, 4,463,819, Cl. 180-132.000.
Day, Richard L., 4,463,546, Cl. 56-364.000.
Freiburger, Thomas W., 4,463,622, Cl. 74-337.500.
Griffith, Michael J., 4,463,718, Cl. 123-242.000.
Hubbard, Arthur L.; Copley, Russell D.; and Reichen, Ronald L., 4,463,543, Cl. 56-44.000.
Long, John D.; and Stevens, Phillip E., 4,463,813, Cl. 172-705.000.
Miller, James A.; and Eagles, Derek M., 4,463,557, Cl. 60-422.000.
Miller, James A.; and Eagles, Derek M., 4,463,558, Cl. 60-422.000.
Nelson, Roger J., 4,463,659, Cl. 91-404.000.
Roach, Maurice P., 4,463,864, Cl. 220-4.00F.
Tsai, Edward S., 4,463,733, Cl. 123-501.000.
Winter, David C., 4,463,811, Cl. 172-26.000.
Wittren, Richard A., 4,463,775, Cl. 137-111.000.
De Forrest, William E. Protecting device for padlocks or other similar locks. 4,463,584, Cl. 70-63.000.
Degen, Helmut; Dix, Johannes P.; Grund, Norbert; Hansen, Guenter; and Krallmann, Reinhold, to BASF Aktiengesellschaft. Mixtures of benzisothiazole mono-azo dyes for cellulose acetate. 4,464,181, Cl. 8-639.000.
Dehn, Dieter, to Stellram GmbH. Device for making holes. 4,464,088, Cl. 408-182.000.
de Lathouder, Hans C., to Stamicarbon B.V. Process for the preparation of methanol. 4,464,483, Cl. 518-703.000.
Delhaes, Johannes C., to Rubber- en Kunststoffabriek ENBI B.V. Sealing device for a pipe connection and method for sealing such a pipe connection. 4,463,955, Cl. 277-1.000.
Delio, Ralph D.; and Diemer, Donald J. Method and apparatus for trimming forgings. 4,463,637, Cl. 83-40.000.
Delta Airlines, Inc.: *See—*
Smith, Cecil B.; and Fox, Finis E., 4,464,648, Cl. 340-51.000.
Demchick, Paul H.: *See—*
Bhaduri, Saumya; and Demchick, Paul H., 4,464,295, Cl. 260-112.00R.
Demoures, Bernard: *See—*
Le Coent, Jean-Louis; and Demoures, Bernard, 4,464,289, Cl. 252-33.400.
den Braber, Antonie A., to Denka Chemie B.V. Process for preparing dimethyl β,β-dichlorovinylphosphate. 4,464,308, Cl. 260-969.000.
Denka Chemie B.V.: *See—*
den Braber, Antonie A., 4,464,308, Cl. 260-969.000.
Denneny, James A., Jr.; and Rowland, Charles M., to Garrett Corporation, The. Cooling control system apparatus and method. 4,463,897, Cl. 236-92.00R.
Densen, Mark S. Knockdown storage unit. 4,463,997, Cl. 312-259.000.
de Rooij, Johannes F. M., to Lever Brothers Company. Process for preparing 4-hydroxy-5-methyl-2,3-dihydro-furanone-3 and changing organoleptic properties of foods. 4,464,409, Cl. 426-536.000.
DeSoto, Inc.: *See—*
Murphy, Edward J., 4,464,436, Cl. 428-463.000.
Des Voignes, Gregory C. Attack repellent holder. 4,463,879, Cl. 222-175.000.
Detras Training Aids Limited: *See—*
Simpson, Anthony; Peterkin, Stuart M.; and Brooksby, Brian T., 4,464,115, Cl. 434-27.000.
Detweiler, Charles A., to Tom McGuane Industries, Inc. Throttle positioning device. 4,463,716, Cl. 123-198.0DB.
Detweiler, Charles A., to Tom McGuane Industries, Inc. Insulated cap and heat sink for automatic choke control. 4,464,310, Cl. 261-39.00E.
Deutsch Fastener Corp.: *See—*
Molina, Jorge W., 4,464,091, Cl. 411-105.000.
DeVore, Robert E. Portable clothes closet bracket. 4,463,883, Cl. 224-42.440.
de Vos, Jacobus A.: *See—*
Misker, Jan S.; and de Vos, Jacobus A., 4,464,733, Cl. 364-900.000.
Devro, Inc.: *See—*
Ziolko, Francis J., 4,463,477, Cl. 17-34.000.
Diamond, Jeffrey; and Winkler, David S. Polymeric composition and use thereof. 4,464,500, Cl. 524-258.000.
Dickakian, Ghazi, to Exxon Research & Engineering Co. Process for production of carbon artifact feedstocks. 4,464,248, Cl. 208-44.000.
Dickover, William E.; Klasek, Ladislav J.; and Passafiume, Anthony, to Johnson & Johnson Baby Products Company. Method for effecting securment of alternating stretched and unstretched elastic ribbon to a moving web. 4,464,217, Cl. 156-164.000.
DiDomenico, Robert A.: *See—*
Bullis, Robert H.; DiDomenico, Robert A.; Kimberley, John A.; McHugh, Thomas M.; Parent, Christopher A.; Voss, James R.; and Wiegand, Walter J., 4,463,729, Cl. 123-478.000.
Diemer, Donald J.: *See—*
Delio, Ralph D.; and Diemer, Donald J., 4,463,637, Cl. 83-40.000.
Dieter Graesslin Feinwerktechnik: *See—*
Thoma, Fritz, 4,463,617, Cl. 74-3.500.
Dingwall, Andrew G. F.: *See—*
Stewart, Roger G.; and Dingwall, Andrew G. F., 4,464,754, Cl. 371-51.000.
Stewart, Roger G.; and Dingwall, Andrew G. F., 4,464,755, Cl. 371-51.000.
Dirnberger, Linus R.: *See—*
Ludwig, Richard H.; Dirnberger, Linus R.; and Husson, Alan L., 4,463,833, Cl. 187-29.00R.
Dix, Johannes P.: *See—*
Degen, Helmut; Dix, Johannes P.; Grund, Norbert; Hansen, Guenter; and Krallmann, Reinhold, 4,464,181, Cl. 8-639.000.
Dixon, Jerry D.; Farrell, Robert H.; Merckel, Gerald U.; Neely, Jack D.; Schmitt, Stephen A.; Verdoorn, William G., Jr.; and Bandy, Peter B., to International Business Machines Corporation. Associative file processing method and apparatus. 4,464,718, Cl. 364-200.000.
D'Luzansky, John S., to Packaging Industries, Inc. Temperature control monitor. 4,464,064, Cl. 374-101.000.

Dobrin, Robert J. Liquid cleaner-diinfectant composition for use in wiping down dental operatories. 4,464,293, Cl. 252-547.000.

Dobrovolny, Pierre, to Zenith Electronics Corporation. Wideband IF amplifier with complementary GaAs FET-bipolar transistor combination. 4,464,636, Cl. 330-300.000.

Dr. Ing. Reiner Foerst GmbH: *See*—
Foerst, Reiner, 4,464,117, Cl. 434-67.000.

Dr. -Ing. Rudolf Heli GmbH: *See*—
Kuhn, Franz; and Lippek, Wilfried, 4,464,677, Cl. 358-75.000.

Dodich, James: *See*—
Anderle, Joseph A.; and Dodich, James, 4,463,536, Cl. 52-488.000.

Doetsch, Paul: *See*—
Suhadolnik, Robert J.; Wu, Joseph M.; Doetsch, Paul; and Henderson, Earl E., 4,464,359, Cl. 424-180.000.

Dohi, Takashi: *See*—
Shinozaki, Nozomu; Dohi, Takashi; and Neki, Shigeo, 4,463,698, Cl. 112-275.000.

Dojki, Kassim H. V. M.; and Haldopoulois, Iaokim, to Porex Technologies, Corp. Device for separating serum from blood sample. 4,464,254, Cl. 210-136.000.

Donaldson, Jack J.: *See*—
Benoit, Gordon L.; Donaldson, Jack J.; and Heilman, Paul D., 4,464,157, Cl. 493-211.000.

Dorfman, Jan L.: *See*—
Huffman, Stanley S.; Dorfman, Jan L.; Frenkel, Robert L.; and Pearce, Ronald A., 4,463,844, Cl. 194-4.00C.

Doroszkowski, Andrew, to Imperial Chemical Industries PLC. Electrophoretic coating process. 4,464,241, Cl. 204-181.00C.

Dost, Gerhard; Gerber, Walter; Jaeger, Eberhard; Moschter, Erwin; and Weiss, Richard, to Dynamit Nobel Aktiengesellschaft. Thermoplastic resin paste impregnated substrates. 4,464,432, Cl. 428-280.000.

Dotson, Danny W.; Mikesell, Jon L.; and Senftle, Frank E., to United States of America, Interior. In situ tritium borehole probe for measurement of tritium. 4,464,338, Cl. 422-78.000.

Dotzman, John G. Trophy mount. 4,464,440, Cl. 428-542.400.

Douglas, Jack E., to Arthur Shaw Manufacturing Limited. Casement windows. 4,463,976, Cl. 292-202.000.

Douthitt Corporation: *See*—
Maher, Robert J.; and Tooson, Ronald, 4,464,047, Cl. 355-93.000.

Dover Findings Inc.: *See*—
Little, Paul V., 4,464,231, Cl. 204-9.000.

Dow Chemical Company, The: *See*—
Burba, John L., III, 4,464,348, Cl. 423-150.000.
Caldwell, Donald L.; and Poush, Kenneth A., 4,464,238, Cl. 204-98.000.
Easterly, James P., Jr., 4,464,508, Cl. 524-787.000.
Hill, Donald G., 4,463,810, Cl. 166-308.000.
Noding, Stephen A., 4,464,236, Cl. 204-78.000.
Stoesser, Paul R.; Cuzic, John E.; and McLaren, John W., 4,463,905, Cl. 239-329.000.
Tasset, Emmett L., 4,464,528, Cl. 536-50.000.
Thomas, Lowell S.; and Paige, William P., 4,464,487, Cl. 521-90.000.

Dowell, Arthur M., Jr.: *See*—
Judd, Henry E.; Dowell, Arthur M., Jr.; and Rahman, Matiur, 4,463,778, Cl. 138-118.100.

Doyle, Richard H.: *See*—
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Dragunas, Alfred R. Reinforcing network for concrete structure. 4,463,538, Cl. 52-677.000.

Dreier, Ernst; and Rickenbach, Jakob, to Fritz Gegauf Bernina Sewing Machine Manufacturers Limited. Cutting attachment for a sewing machine. 4,463,693, Cl. 112-128.000.

Dresser Industries, Inc.: *See*—
Baron, George B.; and Thompson, George J., 4,464,093, Cl. 414-687.000.

Driall, Inc.: *See*—
Applegate, Robert D., 4,463,503, Cl. 34-172.000.
Applegate, Robert D., 4,463,504, Cl. 34-175.000.

Druke, Michael B.: *See*—
Buckley, Edward M.; Druke, Michael B.; and March, Roger W., 4,464,772, Cl. 377-47.000.

Drunasky, Thomas D.: *See*—
Mountain, Craig S.; and Drunasky, Thomas D., 4,463,978, Cl. 294-31.200.

Dubertret, Louis: *See*—
Bisagni, Emile; Dubertret, Louis; Moron, Jacqueline; Averbeck, Dietrich; Papadopoulo, Dora; Blais, Jocelyne; Vigny, Paul; Schwencke, Maria N.; Moustacchi, Ethel; Nocentini, Silvano; and Zajdela, Francois, 4,464,354, Cl. 424-59.000.

Duclos, Gary P., to Joseph M. Herman Shoe Co., Inc. Sole. 4,463,505, Cl. 36-30.00R.

Duhame, Dean C., to Stanley Vemco. Home security and garage door operator system. 4,464,651, Cl. 340-521.000.

Duke, Alan H.: *See*—
Benbase, Michael T.; and Duke, Alan H., 4,464,713, Cl. 364-200.000.

Duke University: *See*—
Porter, Ned A.; Ziegler, Carl B., Jr.; and Roberts, David H., 4,464,304, Cl. 260-410.000.

Duneas, Michel, to UOP Inc. Bracelet mounted screen filter. 4,464,260, Cl. 210-232.000.

Duo-Fast Corporation: *See*—
Geist, Bernard W.; Frank, Edmund; Doyle, Richard H.; and Novak, Raymond F., 4,463,888, Cl. 227-109.000.

Duphar International Research B.V.: *See*—
Rappoldt, Menso P.; Pauli, Louis F.; and Hoogendoorn, Jan, 4,464,298, Cl. 260-239.55C.

Du Pont de Nemours, E. I., and Company: *See*—
Jones, Charles B., 4,464,667, Cl. 346-74.200.
O'Brien, John P., 4,464,323, Cl. 264-187.000.

Duran, John A., to Avibank Mfg., Inc. Captive panel fasteners. 4,464,090, Cl. 411-103.000.

Durrieu, Marc M.; and Thery, Jean-Pierre, to Compagnie Francaise des Petroles. Recovery and treatment of viscous petroleum emulsions. 4,464,057, Cl. 366-139.000.

Dutton, Daniel R.: *See*—
Kaneko, Thomas M.; Dutton, Daniel R.; and Kim, Bongsub, 4,464,193, Cl. 71-83.000.

Duval, Henry H., to Ellis, William B., a part interest. Plastic soil stabilizer composition and method of use. 4,464,200, Cl. 106-90.000.

Dwight, John L., to Precision Connector Designs, Inc. Temperature stabilized electrical connector. 4,464,005, Cl. 339-112.00R.

Dyett, Derek H.: *See*—
Arthur, High M.; Dyett, Derek H.; and Wood, Godfrey A., 4,463,766, Cl. 131-84.00R.

Dynachem Corporation: *See*—
Garber, John L., 4,464,221, Cl. 156-484.000.

Dynamit Nobel Aktiengesellschaft: *See*—
Bunger, Heinrich; Cordes, Rudolf; and Hoffmann, Gerhard, 4,464,477, Cl. 502-24.000.
Dost, Gerhard; Gerber, Walter; Jaeger, Eberhard; Moschter, Erwin; and Weiss, Richard, 4,464,432, Cl. 428-280.000.

E B Metal Industries Inc.: *See*—
Friedman, Evelyn; Borho, Martin A.; Carswell, William R.; and Kecseti, Frank, 4,463,874, Cl. 221-238.000.

E. K. Industries, Inc.: *See*—
Zimmerman, Valentine; and Mrachek, Stephen J., 4,463,687, Cl. 110-233.000.

Eagles, Derek M.: *See*—
Miller, James A.; and Eagles, Derek M., 4,463,557, Cl. 60-422.000.
Miller, James A.; and Eagles, Derek M., 4,463,558, Cl. 60-422.000.

Easterly, James P., Jr., to Dow Chemical Company, The. Water-in-oil emulsions of water-soluble cationic polymers having improved stability. 4,464,508, Cl. 524-787.000.

Eastern Safety Equipment Co., Inc.: *See*—
Hanson, George N., 4,463,456, Cl. 2-416.000.

Eastman Kodak Company: *See*—
Guild, John R., 4,464,461, Cl. 430-326.000.
Leonard, Eric M.; and Knight, William W., 4,464,670, Cl. 346-137.000.

Eastman, Willard L.; Lempel, Abraham; Ziv, Jacob; and Cohn, Martin, to Sperry Corporation. Apparatus and method for compressing data signals and restoring the compressed data signals. 4,464,650, Cl. 340-347.0DD.

Eberl, Karl; Engelmann, Manfred; and Fischer, Edgar, to Hoechst Aktiengesellschaft. Process for preparing vinyl chloride polymers. 4,464,516, Cl. 526-62.000.

Eberly, Paul E., Jr.; and Winter, William E., Jr., to Exxon Research & Engineering Co. Adsorbents for sulfur removal. 4,464,252, Cl. 208-243.000.

Ebert, Heinrich; Noe, Manfred; Wind, Kurt; and Kirsch, Wilhelm, to Carl Freudenberg, Firma. Closed cell foamed material having interior canals filled with substances. 4,464,428, Cl. 428-95.000.

Ecolotrol, Inc.: *See*—
Owens, Roger W.; Hickey, Robert F.; and Capetanopoulos, Constantine, 4,464,262, Cl. 210-291.000.

Economics Laboratory: *See*—
Olson, John T., 4,464,098, Cl. 417-397.000.

Eddins, W. T., to Harris Corporation. Transimpedance pre-amplifier. 4,464,630, Cl. 330-107.000.

Edelson, Richard L., to Bourke, Frederic A., Jr.; Bourke, Eleanor F.; Edelson, Richard L.; and Edelson Trust, The. Method for externally treating the blood. 4,464,166, Cl. 604-6.000.

Edelson Trust, The: *See*—
Edelson, Richard L., 4,464,166, Cl. 604-6.000.

Edson, David; D.: *See*—
Ouellette, Charles W.; and Edson, David; D., 4,464,130, Cl. 441-25.000.

Education & Informations Systems, Inc.: *See*—
Props;, Franklin M., 4,464,689, Cl. 360-78.000.

Edwards, Ralph W., to General Motors Corporation. Radio antenna and connector apparatus. 4,464,664, Cl. 343-715.000.

Eiermann, Dankwart, to Wankel GmbH. External axis rotary piston compressor. 4,464,102, Cl. 418-179.000.

Eliason, Robbin D.; and Rotondo, Claude P., to United Technologies Corporation. Split inner race bearing. 4,463,994, Cl. 308-196.000.

Elkin, Orville E. Batting practice trainer. 4,463,950, Cl. 273-26.00R.

Elliott, Michael; Janes, Norman F.; and Pulman, David A., to National Research Development Corporation. Pesticides. 4,464,391, Cl. 424-304.000.

Ellis, William B.: *See*—
Duval, Henry H., 4,464,200, Cl. 106-90.000.

Ellman, Alan: *See*—
Garito, Jon C.; Ellman, Alan; and Rozensher, Zvi, 4,463,759, Cl. 128-303.140.

Elmovist, Hakan, to Siemens Aktiengesellschaft. Implantable heart pacemaker. 4,463,760, Cl. 128-419.0PG.

Elster AG Mess- und Regeltechnik: *See*—
Schmittner, Dieter; and Schwarz, Manfred, 4,463,613, Cl. 73-861.830.

Emerson, Lucy T. Y.: *See—*
Spethmann, Donald H.; and Emerson, Lucy T. Y., 4,463,574, Cl. 62-175.000.
Emkey, William L., to AT&T Bell Laboratories. Optical circulator. 4,464,022, Cl. 350-377.000.
Empire Level Mfg. Corp.: *See—*
Wright, Randall J.; and Macklin, Gary T., 4,463,501, Cl. 33-350.000.
Enea, Orville M., to Motorola, Inc. All-level Rayleigh fader. 4,464,791, Cl. 455-67.000.
Engelmann, Manfred: *See—*
Eberl, Karl; Engelmann, Manfred; and Fischer, Edgar, 4,464,516, Cl. 526-62.000.
Englar, Robert J.: *See—*
Nichols, James H., Jr.; Furey, Roger J.; Englar, Robert J.; and Lee, David G., 4,463,920, Cl. 244-207.000.
Ennis, James, to Silver Industries, Inc. Two compartment mixing syringe seal. 4,464,174, Cl. 604-90.000.
Enterra Corporation: *See—*
Chiesa, Peter J., Jr.; and Norman, Edward C., 4,464,267, Cl. 252-8.050.
Environmental Research Institute of Michigan: *See—*
Sternberg, Stanley R.; Lougheed, Robert M.; and Dargel, William O., 4,464,788, Cl. 382-41.000.
Sternberg, Stanley R., 4,464,789, Cl. 382-48.000.
Ergun, Joseph, to Maremont Corporation. Coupling with improved tube-gripping member. 4,463,974, Cl. 285-323.000.
Erickson, Donald C. Cryogenic gas separation with liquid exchanging columns. 4,464,191, Cl. 62-31.000.
Erker, Joseph W., to Technicare Corporation. Multiplexing signal processing channels in a CT scanner with rotating source. 4,464,776, Cl. 378-010.000.
Erwin, Galen B.: *See—*
Arnold, Harmon W.; Erwin, Galen B.; Gowing, John P.; and Mundell, David D., 4,464,218, Cl. 156-244.120.
Erwin Sick GmbH Optik-Elektronik: *See—*
Sick, Erwin; Fetzer, Gunter; and Winterer, Hermann, 4,464,014, Cl. 350-105.000.
Escher Wyss Limited: *See—*
Miller, Helmut; Baumann, Kurt; Halder, Franz; and Meystre, Noel, 4,464,580, Cl. 290-52.000.
Essilor International Cie Generale d'Optique: *See—*
Lhospice, Bernard, 4,464,025, Cl. 351-106.000.
Esteban, Daniel J.: *See—*
Beraud, Jean-Paul; Esteban, Daniel J.; and Galand, Claude, 4,464,783, Cl. 381-31.000.
Estee Lauder Inc.: *See—*
Klodas, Martin; and Heise, Dieter, 4,464,362, Cl. 424-195.000.
Esumi, Kunio: *See—*
Masui, Michio; Ogawa, Yasuhiro; and Esumi, Kunio, 4,464,696, Cl. 361-42.000.
Etablissements Paul Jacottet: *See—*
Jacottet, Jean-Louis, 4,463,838, Cl. 188-299.000.
Etienne Lacroix Tous Artifices SA: *See—*
Billard, Alain, 4,463,679, Cl. 102-336.000.
Etoh, Satoshi; Kobayashi, Junichi; and Tanimoto, Kenji, to Fuji Xerox Co., Ltd. Auxiliary scanning control system for facsimile. 4,464,682, Cl. 358-288.000.
Eumuco Aktiengesellschaft fur Maschinenbau: *See—*
Werner, Eberhard, 4,463,587, Cl. 72-43.000.
Eurobond Coatings Limited: *See—*
Beer, Michael W., 4,464,220, Cl. 156-273.300.
Eurosil GmbH: *See—*
Hentzschel, Hanspeter; and Beek, Achim, 4,464,584, Cl. 307-200.00A.
Eventide Clockworks, Inc.: *See—*
Agnello, Anthony M., 4,464,784, Cl. 381-61.000.
Everts, Robert G. Coupling for flailing line trimmer handles. 4,463,498, Cl. 30-296.00R.
Ex-Cell-O Corporation: *See—*
Kalokhe, Shivdas A., 4,464,085, Cl. 407-105.000.
Excelermatic Inc.: *See—*
Horton, Paul L., 4,463,620, Cl. 74-200.000.
Extracorporeal Medical Specialties, Inc.: *See—*
Troutner, Vernon H.; and Morrow, Richard A., 4,464,164, Cl. 604-5.000.
Exxon Production Research Co.: *See—*
Pierce, Aaron E.; and Rickey, Wynn P., 4,463,597, Cl. 73-40.50R.
Exxon Research & Engineering Co.: *See—*
Dickakian, Ghazi, 4,464,248, Cl. 208-44.000.
Eberly, Paul E., Jr.; and Winter, William E., Jr., 4,464,252, Cl. 208-243.000.
King, William M.; and Wight, William W., 4,464,494, Cl. 523-400.000.
Tack, Robert D.; Lewtas, Kenneth; and Brazier, John R., 4,464,182, Cl. 44-62.000.
Walker, Thad O.; and Matthews, Patricia C., 4,464,269, Cl. 252-8.55R.
F. D. Farnam, Inc.: *See—*
Farnam, Robert G., 4,463,704, Cl. 118-642.000.
F.I.N.D. Research Corporation: *See—*
Gannon, James J., 4,464,402, Cl. 426-242.000.
Fabricius, Hans-Ake; and Stahn, Roland, to Hooper Trading Co. Serum-free and mitogen-free T-cell growth factor and process for making same. 4,464,355, Cl. 424-101.000.
Facet Enterprises, Inc.: *See—*
Brown, Ralph V., 4,464,613, Cl. 318-119.000.
Williams, James O., 4,464,576, Cl. 290-38.00R.
Falamak, Reza, to Robot Crabtor International. Drivable, steerable platform for lawnmower and the like. 4,463,821, Cl. 180-168.000.
Fanuc Ltd.: *See—*
Kurakake, Mitsuo, 4,464,614, Cl. 318-571.000.
Farkas nee Kirjak, Maria: *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Kreidl, Janos; Nemes, Andras; Farkas nee Kirjak, Maria; Visky, Gyorgy; and Czibula, Laszlo , 4,464,534, Cl. 546-51.000.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Kreidl, Janos; Visky, Gyorgy; Nemes, Andras; Czibula, Laszlo ; and Farkas nee Kirjak, Maria, 4,464,535, Cl. 546-51.000.
Farlow, Adrian R., to Barr & Stroud Limited. Laser rangefinders. 4,464,048, Cl. 356-5.000.
Farnam, Robert G., to F. D. Farnam, Inc. Apparatus for coating liquid penetrable articles with polymeric dispersions. 4,463,704, Cl. 118-642.000.
Farrell, Christopher J.; Tsai, Boh C.; and Wachtel, James A., to American Can Company. Drying agent in multi-layer polymeric structure. 4,464,443, Cl. 428-688.000.
Farrell, Robert H.: *See—*
Dixon, Jerry D.; Farrell, Robert H.; Merckel, Gerald U.; Neely, Jack D.; Schmitt, Stephen A.; Verdoorn, William G., Jr.; and Bandy, Peter B., 4,464,718, Cl. 364-200.000.
Faw, Garland, to Precision Interlock Log Homes, Inc. Prefabricated wall unit for log building construction, method of producing same and method of constructing log building therewith. 4,463,532, Cl. 52-233.000.
Federal-Mogul Corp.: *See—*
Butler, John D., 4,464,322, Cl. 264-138.000.
Feitler, Albert: *See—*
Mercatoris, Robert; Artois, Fernand; Colling, Joseph; and Feitler, Albert, 4,464,055, Cl. 366-26.000.
Fender, C. Leo. Angled humbucking pick-up for an electrical musical instrument of the stringed type. 4,463,648, Cl. 84-1.150.
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, to Hirsh Company. Straight edge guide. 4,463,644, Cl. 83-745.000.
Fergg, Berthold: *See—*
Findeis, Gunter; Fergg, Berthold; Zahn, Wolfgang; and Kuhn, Gerhard, 4,464,045, Cl. 355-38.000.
Ferlay, Aime : *See—*
Auchapt, Pierre; and Ferlay, Aime , 4,464,341, Cl. 422-202.000.
Fernandez, Alexander T. Manually moving a trailer. 4,463,961, Cl. 280-3.000.
Fetzer, Gunter: *See—*
Sick, Erwin; Fetzer, Gunter; and Winterer, Hermann, 4,464,014, Cl. 350-105.000.
Fiedler, Johann: *See—*
Hittel, Gerhard; and Fiedler, Johann, 4,463,580, Cl. 66-84.00A.
Fieldsteel, A. Howard; Cox, David L.; and Moeckli, Randolph A., to SRI International. Replication of virulent treponema pallidum in tissue culture. 4,464,470, Cl. 435-253.000.
Findeis, Gunter; Fergg, Berthold; Zahn, Wolfgang; and Kuhn, Gerhard, to Agfa-Gevaert Aktiengesellschaft. Method of and an arrangement for calibrating a color copying apparatus. 4,464,045, Cl. 355-38.000.
Finkelshtein, Georgy A.: *See—*
Ivanov, Nikolai A.; Ivanov, Boris G.; Zagoratsky, Leonid P.; Mitrofanov, Evgeny S.; Cherkassky, Vladimir A.; Finkelshtein, Georgy A.; Blekhman, Ilya I.; Barzukov, Oleg P.; Kaljunov, Gennady A.; Khinich, Isaak Y.; and Turkin, Vladimir Y., 4,463,908, Cl. 241-207.000.
Finkenzeller, Johann; Schmidt, Wilfried; and Reinfelder, Heinz, to Siemens Aktiengesellschaft. X-ray examination device. 4,464,779, Cl. 378-176.000.
Firetek Corporation: *See—*
Cholin, John M.; Cholin, Jeffrey G.; and Voorhis, Ray, 4,464,575, Cl. 250-554.000.
Fischer, Edgar: *See—*
Eberl, Karl; Engelmann, Manfred; and Fischer, Edgar, 4,464,516, Cl. 526-62.000.
Fish, Leonard A.; and Hanger, Thomas, to Casino Technology. Apparatus and method for currency validation. 4,464,787, Cl. 382-7.000.
Fisher, Alan R., to Ford Motor Company. Multiple countershaft automatic transmission. 4,463,621, Cl. 74-330.000.
Fisher, Edwin P.: *See—*
Keeley, James W.; Fisher, Edwin P.; and Curley, John L., 4,464,717, Cl. 364-200.000.
Fitzgerald, Thomas J.; and Levenspiel, Octave. Magnetic distributor-downcomer for fluidized beds and magnetic valve to control the flow of solids. 4,463,502, Cl. 34-1.000.
Fitzner, Arthur O., to Brunswick Corporation. Capacitor discharge ignition system for internal combustion engines. 4,463,743, Cl. 123-599.000.
Fives-Cail Babcock: *See—*
Chiclens, Alain; Benoit, Philippe; and Roggo, Bernard, 4,463,795, Cl. 164-455.000.
Flaum, Charles, to Schlumberger Technology Corporation. Method and apparatus for spectroscopic analysis of a geological formation. 4,464,569, Cl. 250-270.000.
Flax, Stephen W.; and Glover, Gary H., to General Electric Company. Method of determining operating characteristics of ultrasonic scanning systems. 4,463,592, Cl. 73-1.0DV.

Fletcher, Robert P., to International Business Machines Corporation. Second level cache replacement method and apparatus. 4,464,712, Cl. 364-200.000.

Flex-O-Lators, Inc.: *See*—
Arnold, Harmon W.; Erwin, Galen B.; Gowing, John P.; and Mundell, David D., 4,464,218, Cl. 156-244.120.

Foerst, Reiner, to Dr. Ing. Reiner Foerst GmbH. Driving simulator apparatus. 4,464,117, Cl. 434-67.000.

Fokos, Robert F.: *See*—
Cogswell, John; Fokos, Robert F.; and Alden, Dale E., 4,463,640, Cl. 83-116.000.

Follows, Christopher: *See*—
McDonald, Thomas J.; and Follows, Christopher, 4,464,442, Cl. 428-654.000.

Forapianti, Mauro: *See*—
Roca-Nierga, Manuel; and Forapianti, Mauro, 4,463,726, Cl. 123-449.000.

Force Control Industries, Inc.: *See*—
Kelley, Reginald D., 4,463,841, Cl. 192-18.00A.

Ford Aerospace & Communications Corporation: *See*—
Sobczak, Isidore F.; Cleveland, William C., Jr.; and Pons, Robert L., 4,463,749, Cl. 126-451.000.

Ford, David E., Jr.; and Kannenberg, Daniel G., to Allen-Bradley Company. Three terminal solid state pilot light. 4,464,605, Cl. 315-134.000.

Ford Motor Company: *See*—
Fisher, Alan R., 4,463,621, Cl. 74-330.000.
Hellriegel, Edmund, 4,463,983, Cl. 296-213.000.
Stojek, Dieter; and Weigmann, Gerhard, 4,463,712, Cl. 123-90.170.
Zeno, Robert V.; Lutz, George A.; and Amin, Jayendra J., 4,463,573, Cl. 62-157.000.

Forrest, Louis. Lighting fixture. 4,464,707, Cl. 362-222.000.

Forsberg, Gunnar S.; and Ingre, Lars P., to Telefonaktiebolaget L M Ericsson. Method and apparatus for synchronizing a binary data signal. 4,464,769, Cl. 375-110.000.

Forster, Ewald: *See*—
Kramer, Hans; Zahir, Sheik A.; and Forster, Ewald, 4,464,486, Cl. 521-83.000.

Forster, Hans: *See*—
Leckband, Uwe; Thiele, Willi; Hagenah, Klaus; and Forster, Hans, 4,463,769, Cl. 131-109.0AB.

Fortin, Romeo G. Band saw. 4,463,638, Cl. 83-62.100.

Foster, Randy C., to Dayco Corporation. Belt tensioner and method of making the same. 4,464,147, Cl. 474-135.000.

Fox, Finis E.: *See*—
Smith, Cecil B.; and Fox, Finis E., 4,464,648, Cl. 340-51.000.

Fram Corporation: *See*—
Brownell, Peter, 4,464,263, Cl. 210-484.000.

Frank, Edmund: *See*—
Geist, Bernard W.; Frank, Edmund; Doyle, Richard H.; and Novak, Raymond F., 4,463,888, Cl. 227-109.000.

Frank, Georg: *See*—
Maurer, Robert; and Frank, Georg, 4,464,770, Cl. 375-119.000.

Franklin, James L.: *See*—
Pogson, John T.; Shannon, Roger L.; Hamasaki, Robert H.; Franklin, James L.; Watkins, Dale F.; and Kramer, Ted J., 4,463,798, Cl. 165-1.000.

Franklin, Robert C. Electronic wall stud sensor. 4,464,622, Cl. 324-67.000.

Franklin, Robert C.: *See*—
Parkes, Christopher W.; and Franklin, Robert C., 4,464,727, Cl. 364-718.000.

Franz, Klaus-Dieter: *See*—
Naarmann, Herbert; Penzien, Klaus; Muench, Volker; and Franz, Klaus-Dieter, 4,464,511, Cl. 525-61.000.

Fredericks, Edward C.: *See*—
Chow, Ming-Fea; Fredericks, Edward C.; and Moreau, Wayne M., 4,464,458, Cl. 430-312.000.

Freeman, Smith: *See*—
Schiff, Leonard N.; and Freeman, Smith, 4,464,678, Cl. 358-122.000.

Freiburger, Thomas W., to Deere & Company. Transmission and reverse gear synchronizing therefor. 4,463,622, Cl. 74-337.500.

French, James E., to Hercules Incorporated. Acicular ferromagnetic metal particles. 4,464,196, Cl. 75-0.5AA.

Frenkel, Robert L.: *See*—
Huffman, Stanley S.; Dorfman, Jan L.; Frenkel, Robert L.; and Pearce, Ronald A., 4,463,844, Cl. 194-4.00C.

Friedman, Evelyn; Borho, Martin A.; Carswell, William R.; and Kecseti, Frank, to E B Metal Industries Inc. Vending machine having card moving fingers. 4,463,874, Cl. 221-238.000.

Friedrich, Heinz: *See*—
Burger, Kurt; Friedrich, Heinz; Gruner, Heiko; Linn, Karl-Otto; and Zabler, Erich, 4,464,646, Cl. 338-25.000.

Fritz Gegauf Bernina Sewing Machine Manufacturers Limited: *See*—
Dreier, Ernst; and Rickenbach, Jakob, 4,463,693, Cl. 112-128.000.

Fritz, Thomas A. Portable chain saw sharpening kit with depth gauge filing attachment. 4,463,499, Cl. 30-382.000.

Frost, Geoffrey M.: *See*—
Parr, Stephen R.; and Frost, Geoffrey M., 4,464,469, Cl. 435-188.000.

Fuji Photo Film Co., Ltd.: *See*—
Kojima, Tetsuro; and Kobayashi, Hidetoshi, 4,464,463, Cl. 430-512.000.
Sugimoto, Naohiko; Kojima, Tetsuro; and Mukunoki, Yasuo, 4,464,462, Cl. 430-512.000.

Fuji Rubber Co. Ltd.: *See*—
Nishihira, Toshihiro, 4,464,326, Cl. 264-246.000.

Fuji Xerox Co., Ltd.: *See*—
Etoh, Satoshi; Kobayashi, Junichi; and Tanimoto, Kenji, 4,464,682, Cl. 358-288.000.
Kanazawa, Yukio; Takahashi, Toshikatsu; and Ishitate, Yoshiyuki, 4,464,046, Cl. 355-57.000.

Fujii, Katsutoshi: *See*—
Kobayashi, Shimaku; Kamoshita, Katsuo; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Takashi; and Kojima, Mikio, 4,464,375, Cl. 424-251.000.

Fujii, Motoharu: *See*—
Koumura, Noboru; Komatsu, Toshiyuki; Nakagawa, Katsumi; Takekawa, Nobuhiro; and Fujii, Motoharu, 4,464,043, Cl. 355-14.00C.

Fujikami, Asao: *See*—
Ueno, Ryuzo; Kanayama, Tatsuo; Tomiyasu, Kunihiko; Fujikami, Asao; and Nakashima, Toshitaka, 4,464,404, Cl. 426-332.000.

Fujikawa, Junichi; Mataki, Hiroshi; Tanaka, Chiaki; and Nakashima, Shinobu, to Toray Industries, Inc. Photosensitive polymer compositions comprising polyether-ester amides. 4,464,456, Cl. 430-281.000.

Fujino, Masahisa; Sunouchi, Akio; Konno, Tatsuo; and Suzuki, Ryuji, to Canon Kabushiki Kaisha. Camera and release device therefore. 4,464,033, Cl. 354-266.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Ohki, Sadao; Hamaguchi, Fumiko; Nagasaka, Tatsuo; and Kikuchi, Hiroyuki, 4,464,361, Cl. 424-180.000.
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,464,369, Cl. 424-246.000.

Fujita, Teizo, to Idec Izumi Corporation. Digital switch. 4,464,549, Cl. 200-42.00R.

Fujitsu Limited: *See*—
Majima, Teiji; and Ozaki, Kiyoshi, 4,464,459, Cl. 430-313.000.
Oritani, Atsushi, 4,464,581, Cl. 307-265.000.
Suzuki, Hiroyuki; Andoh, Ikuhiro; and Watanabe, Kouji, 4,464,002, Cl. 339-97.00P.
Tatematsu, Takeo, 4,464,750, Cl. 371-21.000.
Toyoda, Kazuhiro; Sugo, Yasuhisa; and Yamada, Katuyuki, 4,464,735, Cl. 365-190.000.
Yoneda, Yasuhiro; Kitamura, Kenroh; Naito, Jiro; and Kitakohji, Toshisuke, 4,464,455, Cl. 430-270.000.

Fujitsu Ten Limited: *See*—
Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, 4,463,822, Cl. 180-177.000.

Fujiwara, Akinori: *See*—
Mori, Shinji; Fujiwara, Akinori; and Kawaharazaki, Takashi, 4,463,917, Cl. 242-107.40A.

Fukatsu, Takeo, to Mitsubishi Denki Kabushiki Kaisha. Procelain-clad electrical machine with vibration-on-transportation suppression. 4,464,644, Cl. 336-90.000.

Fukaya, Kastuyoshi; Tokuda, Akira; and Hirano, Hitoshi, to Aisan Kogyo Kabushiki Kaisha. Method for controlling the air-fuel ratio in a carburetor in an internal combustion engine. 4,463,724, Cl. 123-438.000.

Fukuda, Tadaji: *See*—
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,464,451, Cl. 430-65.000.

Fukue, Naofumi: *See*—
Sagisaka, Yasuo; Fukue, Naofumi; and Kondo, Toshio, 4,463,740, Cl. 123-568.000.

Fukui, Kunihiro: *See*—
Wakano, Shigeru; Sakoda, Akito; Fukui, Kunihiro; and Nishihara, Minoru, 4,464,232, Cl. 204-28.000.

Fukumura, Takeo: *See*—
Shinbori, Takeyoshi; Takadera, Ichiro; and Fukumura, Takeo, 4,463,936, Cl. 267-36.00A.

Fukuyama, Katsuhiro; Haruta, Masatoshi; and Takahashi, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Article transfer apparatus. 4,463,873, Cl. 221-12.000.

Fuller, Berkeley; Soll, Linda; Obrecht, Margretta; Poole, Gary; Campbell, Edward F., Jr.; Parsons, Margaret; Chun, Valerie P. P.; Shearer, David R.; and Cashman, Thomas M. Health potential summary and incentive system. 4,464,122, Cl. 434-262.000.

Funada, Ryuichi; and Nakaya, Masato, to Hitachi, Ltd. Composition for forming thick magnetic recording medium. 4,464,278, Cl. 252-62.540.

Furey, Roger J.: *See*—
Nichols, James H., Jr.; Furey, Roger J.; Englar, Robert J.; and Lee, David G., 4,463,920, Cl. 244-207.000.

Furukawa, Saburo: *See*—
Niwa, Hazime; and Furukawa, Saburo, 4,464,424, Cl. 427-296.000.

Furuya, Kazuhito, to Bell Telephone Laboratories, Incorporated. Monolithically integrated distributed Bragg reflector laser. 4,464,762, Cl. 372-50.000.

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Taguchi, Noriyuki; Fuzita, Tsuyoshi; Toda, Gyozo; Ishihara, Syoosaku; Kuroki, Takashi; and Suzuki, Tatsuhiro, 4,464,420, Cl. 427-96.000.

G. D. Searle & Co.: *See*—
Parker, Dawood, 4,463,593, Cl. 73-19.000.

G. D. Societa per Azioni: *See*—
Seragnoli, Enzo, 4,463,767, Cl. 131-84.00B.

Gagnon, Ralph J., to Hughes Aircraft Company. Liquid crystal light valve image projection system with color selective prepolarization and blue mirror. 4,464,018, Cl. 350-331.00R.

Gagnon, Ralph J., to Hughes Aircraft Company. Two-color liquid crystal light valve image projection system with color selective prepolarizers in single optical tank. 4,464,019, Cl. 350-331.00R.
Galand, Claude: *See*—
Beraud, Jean-Paul; and Galand, Claude, 4,464,782, Cl. 381-31.000.
Beraud, Jean-Paul; Esteban, Daniel J.; and Galand, Claude, 4,464,783, Cl. 381-31.000.
Gale, Michael T.; and Knop, Karl H., to RCA Corporation. Dynamic accuracy X-Y positioning table for use in a high precision light-spot writing system. 4,464,030, Cl. 354-4.000.
Gallyamov, Nail I.: *See*—
Surovikin, Vitaly F.; Antonenko, Vladimir F.; Babich, Gennady V.; Bobrik, Mikhail Y.; Korenyak, Nikolai K.; Novikov, Vasily V.; Voloshin, Gennady A.; Belyaev, Georgy A.; Gordeev, Alexandr V.; Gallyamov, Nail I.; and Krikunenko, Anatoly F., 4,464,314, Cl. 261-79.00A.
Gannon, James J., to F.I.N.D. Research Corporation. Process for manufacturing a high protein food material. 4,464,402, Cl. 426-242.000.
GAO Gesellschaft fuer Automation und Organisation mbH: *See*—
Kaule, Wittich; Schwenk, Gerhard; and Stenzel, Gerhard, 4,463,970, Cl. 283-72.000.
Gao Gesellschaft fur Automation und Organisation mbH: *See*—
Hoppe, Joachim; and Haghiri-Tehrani, Yahya, 4,463,971, Cl. 283-83.000.
Garbarini, Philip P.; and Noe, Renato R., to Public Service Electric and Gas Company. Closure seal for high pressure vessel. 4,463,871, Cl. 220-378.000.
Garber, John L., to Dynachem Corporation. Automatic laminator. 4,464,221, Cl. 156-484.000.
Gardiner, Richard J., to Hercules Incorporated. Composite negator springs. 4,464,216, Cl. 156-162.000.
Garito, Jon C.; Ellman, Alan; and Rozensher, Zvi. Universal finger/-foot switch adaptor for tube-type electrosurgical instrument. 4,463,759, Cl. 128-303.140.
Garlock, Inc.: *See*—
McCord, H. Lee, 4,463,975, Cl. 285-419.000.
Garner, Daniels S.: *See*—
Greenawalt, Eddie L.; Ray, Steve C.; and Garner, Daniels S., 4,463,542, Cl. 53-479.000.
Garrett Corporation, The: *See*—
Denneny, James A., Jr.; and Rowland, Charles M., 4,463,897, Cl. 236-92.00R.
Kindlimann, Lynn E., 4,464,207, Cl. 148-16.600.
McInerney, Charles E., 4,463,564, Cl. 60-602.000.
Garwin, Mark J. Intravascular insertion apparatus and method. 4,464,171, Cl. 604-53.000.
Gates Rubber Company, The: *See*—
Wink, Clifford W.; and Bixby, Guy T., 4,463,779, Cl. 138-125.000.
Gaub, Arnold A. Grader blade attachment. 4,463,507, Cl. 37-117.500.
Gautier, Jean-Claude: *See*—
Sturtz, Georges; Pensec, Thierry; and Gautier, Jean-Claude, 4,464,346, Cl. 423-10.000.
Gavaletz, Eugene J.: *See*—
Usher, Peter P.; and Gavaletz, Eugene J., 4,463,959, Cl. 277-230.000.
Geelan, Brendan J.: *See*—
Nemzek, Thomas L.; and Geelan, Brendan J., 4,464,496, Cl. 524-91.000.
Geffen, Samuel E.: *See*—
Mason, Carl E.; and Geffen, Samuel E., 4,463,808, Cl. 166-292.000.
Geist, Bernard W.; Frank, Edmund; Doyle, Richard H.; and Novak, Raymond F., to Duo-Fast Corporation. Fastener driving tool. 4,463,888, Cl. 227-109.000.
General Dynamics/Electronics Division: *See*—
Osterwalder, Johann M., 4,464,624, Cl. 324-77.00K.
General Electric Company: *See*—
Bakanowski, Stephen M.; and Miller, Matthew S., 4,464,554, Cl. 219-10.55F.
Belfoure, Edward L., 4,464,497, Cl. 524-114.000.
Flax, Stephen W.; and Glover, Gary H., 4,463,592, Cl. 73-1.0DV.
Hanson, Raymond F., 4,464,793, Cl. 455-154.000.
Hegyi, Steven M.; and St. Jacques, Joseph A., 4,464,004, Cl. 339-111.000.
Johnson, Ronald L., 4,464,551, Cl. 200-83.00P.
Kosmatka, Walter J.; and Zalar, Frank E., 4,464,600, Cl. 313-318.000.
Liu, Ping Y.; and Miller, Kenneth F., 4,464,512, Cl. 525-146.000.
McVey, Charles I., 4,464,603, Cl. 313-624.000.
Miller, Timothy J. E.; Jones, Donald W.; Richter, Eike; and Kalan, Gary L., 4,464,596, Cl. 310-156.000.
Peil, William; Brown, Thomas A.; and Harris, James E., 4,464,607, Cl. 315-209.00R.
Schultz, Frederick E., 4,464,097, Cl. 416-230.000.
Ulug, Mehmet E., 4,464,749, Cl. 370-85.000.
Wagner, James B.; and Chamberlain, Harvey H., 4,464,577, Cl. 290-40.00A.
General Foods Corporation: *See*—
Leshik, Richard R.; Iyer, Bala S.; and Carpenter, John R., 4,464,403, Cl. 426-271.000.
General Mills Products Corp.: *See*—
Strasser, Andy, 4,463,856, Cl. 211-163.000.
General Motors Corporation: *See*—
Bogden, Dennis M., 4,463,728, Cl. 123-475.000.
Bridges, David B.; and Schulte, John J., 4,464,142, Cl. 464-92.000.
Burnett, Dale E.; Butts, Mervin R.; and Trissel, Paul E., 4,463,576, Cl. 62-228.300.
Dais, William F.; and Malarz, Antoni J., 4,463,881, Cl. 222-375.000.
Edwards, Ralph W., 4,464,664, Cl. 343-715.000.
Malott, Richard C., 4,463,956, Cl. 277-12.000.
Rask, Rodney B., 4,463,601, Cl. 73-118.000.
Rees, Richard W. A., 4,463,922, Cl. 248-429.000.
Stoltman, Donald D., 4,463,735, Cl. 123-525.000.
Wich, Thomas J., 4,463,900, Cl. 239-88.000.
Genetic Systems Corporation: *See*—
Lostrom, Mark E., 4,464,465, Cl. 435-68.000.
Georgia Tech Research Institute: *See*—
Tedder, Daniel W., 4,464,189, Cl. 62-24.000.
Gerber Garment Technology, Inc.: *See*—
Gerber, Heinz J., 4,463,639, Cl. 83-71.000.
Gerber, Heinz J., to Gerber Garmest Technology, Inc. Fluid jet receiver positioner. 4,463,639, Cl. 83-71.000.
Gerber, Walter: *See*—
Dost, Gerhard; Gerber, Walter; Jaeger, Eberhard; Moschter, Erwin; and Weiss, Richard, 4,464,432, Cl. 428-280.000.
Gerecke, Max: *See*—
Borer, Rene; Gerecke, Max; and Kyburz, Emilio, 4,464,300, Cl. 260-245.500.
Gerfast, Sten R., to Minnesota Mining and Manufacturing Company. Snap-action cartridge for recording disc. 4,464,693, Cl. 360-135.000.
Gerken, John M., to TRW Inc. Turbine engine component and method of making the same. 4,464,094, Cl. 415-217.000.
Germain, Alfred; and Roth, Bernard, to Union Siderurgique Du Nord Et De L'Est De La France. Device for closing the ends of a machine for treating metal sheets. 4,463,771, Cl. 134-122.00R.
Gerry, Martin E. Fuel and water homogenizer. 4,463,708, Cl. 123-25.00E.
Geurtsen, Alfonsus A., to Machinefabriek Geurtsen Deventer B.V. Reel for a life-line. 4,463,830, Cl. 182-238.000.
Ghafourian, Ali A., to McGraw-Edison Company. Tap changing mechanism. 4,464,547, Cl. 200-17.00R.
Giallanza, Sam J. Tool and method for picking fruit. 4,463,545, Cl. 56-337.000.
Giangiulio, Clayton; and D'Ambro, Dominic, to Le-Jo Enterprises, Inc. Capped plastic container. 4,464,109, Cl. 431-344.000.
Giannetti, Enzo: *See*—
Scata, Umberto; Albizzati, Enrico; and Giannetti, Enzo, 4,464,478, Cl. 502-111.000.
GIBA AG Gesellschaft fur Industrialisierung in Bauwesen: *See*—
Bomberger, Werner, 4,463,926, Cl. 249-47.000.
Gierse, Franzjosef: *See*—
Berger, Rolf; Bonsen, Josef; Haffmans, Josef; Schafer, Max; Teetz, Wolfgang; and Gierse, Franzjosef, 4,463,692, Cl. 112-102.000.
Gilman, David J.: *See*—
Yellin, Tobias O.; Gilman, David J.; Jones, Derrick F.; and Oldham, Keith, 4,464,374, Cl. 424-251.000.
Ginn, Warren G., to S-Cubed. Multichannel remote transducer monitoring system. 4,464,660, Cl. 340-870.380.
Giovannoni, Guido: *See*—
Pittalis, Francesco; Bartoli, Francesco; and Giovannoni, Guido, 4,464,321, Cl. 264-83.000.
Githens, Charles J.: *See*—
Hollenbeak, Keith H.; and Githens, Charles J., 4,464,270, Cl. 252-8.55R.
Glacier Products, Inc.: *See*—
Brown, E. Vernon, Jr., 4,463,572, Cl. 62-135.000.
Glasser, Lance A.: *See*—
Haus, Hermann A.; Glasser, Lance A.; and Ho, Ping-Tong, 4,464,759, Cl. 372-18.000.
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O'Callaghan, Cynthia H.; Ayres, Barry E.; Newall, Christopher E.; Livermore, David G. H.; and Sutherland, Derek R., 4,464,368, Cl. 424-246.000.
Glotzl, Franz: *See*—
Glotzl, Rainer; and Glotzl, Franz, 4,463,611, Cl. 73-784.000.
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Glotzl, Rainer; and Glotzl, Franz, 4,463,611, Cl. 73-784.000.
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Glover, Gary H.: *See*—
Flax, Stephen W.; and Glover, Gary H., 4,463,592, Cl. 73-1.0DV.
Glover, Wayne; and Medero, Richard, to Critikon, Inc. Arm simulator for an oscillometric blood pressure monitor. 4,464,123, Cl. 434-268.000.
Gneuss, Detlef. Adjustable ring nozzle for extruding synthetic-resin tubing. 4,464,104, Cl. 425-192.00R.
Goda, Boyd D.: *See*—
Collura, Peter C.; Goda, Boyd D.; and Palagi, Harvey N., 4,464,155, Cl. 493-137.000.
Godshalk, James B.: *See*—
Bressler, Glenn O.; and Godshalk, James B., 4,463,705, Cl. 119-45.00R.
Goeken, George W. Router adapter for radial arm saw. 4,463,785, Cl. 144-1.00F.
Goel, Anil B., to Ashland Oil, Inc. Manufacture of higher aryl esters cross-reference to related applications. 4,464,303, Cl. 260-410.000.
Goellner, Willy J., to Speedcut, Inc. Circular saw. 4,463,645, Cl. 83-852.000.
Gogniat, Paul, to Montres Rado S.A. Watch case comprising resilient U-shape clamping members connecting crystal and case. 4,464,063, Cl. 368-276.000.

Gold, Philip, to Cordis Corporation. Screw-in pacing lead assembly. 4,463,765, Cl. 128-785.000.

Goldman, Ernest A.; McCarthy, Jeremiah P.; and Poppert, Paul E., to GTE Laboratories Incorporated. Method of fabricating a monolithic integrated circuit structure. 4,463,491, Cl. 29-571.000.

Goldmann, Norbert, to Siemens Aktiengesellschaft. X-ray examination means. 4,464,778, Cl. 378-150.000.

Goodman, Joseph R.; Woratyla, John A.; and Zell, Dale R., to AMP Incorporated. Insulation displacing connector with programmable ground bussing feature. 4,464,003, Cl. 339-99.00R.

Gordeev, Alexandr V.: *See*—
Surovikin, Vitaly F.; Antonenko, Vladimir F.; Babich, Gennady V.; Bobrik, Mikhail Y.; Korenyak, Nikolai K.; Novikov, Vasily V.; Voloshin, Gennady A.; Belyaev, Georgy A.; Gordeev, Alexandr V.; Gallyamov, Nail I.; and Krikunenko, Anatoly F., 4,464,314, Cl. 261-79.00A.

Gordon, Alexander J.: *See*—
Gordon, Alfred J., 4,463,540, Cl. 52-730.000.

Gordon, Alfred J., to Gordon, Alexander J. Extrusion for insulated building constructions. 4,463,540, Cl. 52-730.000.

Gordon Barlow Design: *See*—
Barlow, Gordon A.; Krutsch, John R.; Smollar, Marvin; and Liedtke, Ronald, 4,463,515, Cl. 446-409.000.

Gordon, Stuart P., to Bob Allen Companies, Inc., The. Rust-preventive firearms receptacle. 4,463,847, Cl. 206-205.000.

Gorges, Friedrich J.; and Hodges, Robert V., to Boeing Company, The. Fuselage-mounted valve for condensate drainage and cabin-air pressurization. 4,463,774, Cl. 137-81.100.

Gorin, Georges J., to Tegal Corp. Plasma reactor apparatus and method. 4,464,223, Cl. 156-643.000.

Gorlov, Alexander M. High volume tidal or current flow harnessing system. 4,464,080, Cl. 405-76.000.

Gorog, Istvan, to RCA Corporation. Video disc caddy. 4,463,850, Cl. 206-309.000.

Gorris, Rainer: *See*—
Hermann, Wolfgang; Ruter, Bernhard; Gorris, Rainer; and Nowak, Herbert, 4,463,690, Cl. 110-336.000.

Gowing, John P.: *See*—
Arnold, Harmon W.; Erwin, Galen B.; Gowing, John P.; and Mundell, David D., 4,464,218, Cl. 156-244.120.

Gramlich, Walter; Himmele, Walter; Martin, Christoph; Pommer, Ernst-Heinrich; and Siegel, Hardo, to BASF Aktiengesellschaft. Cyclohexene containing morpholines and fungicidal use. 4,464,370, Cl. 424-248.400.

Grantham, Frederick W. Laundry stacking apparatus. 4,463,944, Cl. 271-200.000.

Grantham, Frederick W. Shop towel folder. 4,464,159, Cl. 493-419.000.

Graybill, Larry: *See*—
Hillier, Edward; Graybill, Larry; Winders, Richard; Bridge, Dan; and Dauchy, Joe, 4,464,081, Cl. 405-128.000.

Green, Sheldon R., to Hickey, Lois G. Automatic bowling lane maintenance machine. 4,463,469, Cl. 15-98.000.

Green, Steve: *See*—
Kloenne, Arthur F., 4,463,947, Cl. 272-116.000.

Green, Vicki: *See*—
Kloenne, Arthur F., 4,463,947, Cl. 272-116.000.

Green, William J.; and Semmerling, Ralph P., to United States Gypsum Company. Connector and web stiffener. 4,464,074, Cl. 403-192.000.

Greenawalt, Eddie L.; Ray, Steve C.; and Garner, Daniels S., to Package Machinery Company. Method for forming heat seals. 4,463,542, Cl. 53-479.000.

Greene, Vibert F. Baby bottle feeding system. 4,463,859, Cl. 215-11.00R.

Greene, William J., to Teledyne-Walterboro, a Divison of Teledyne Industries, Inc. Phase-converting, variable output, power source utilizing Scott connection. 4,464,559, Cl. 219-130.510.

Greenhut, Bart E., to L'Aimee Laboratoires, Ltd. Shower dispenser container-receiver coupling system. 4,463,462, Cl. 4-605.000.

Greenleaf, Allen H.; and Milamed, Robert L., to Itek Corporation. Thermal actuator apparatus. 4,463,560, Cl. 60-527.000.

Greis, Howard A. Skewed-axis cylindrical die rolling. 4,463,588, Cl. 72-98.000.

Greynolds, Fred L.: *See*—
Whiteside, Robert C.; and Greynolds, Fred L., 4,464,329, Cl. 264-544.000.

Griffin, Alan O., to Reycan Research Limited. Auto wrap angle/positioner for shape sensing roll. 4,463,586, Cl. 72-17.000.

Griffin, Arthur B.: *See*—
Willis, Jeffrey D.; Griffin, Arthur B.; and Boyce, Bernard W., 4,463,568, Cl. 60-742.000.

Griffith, Michael J., to Deere & Company. Lubricant metering system for rotary internal combustion engine. 4,463,718, Cl. 123-242.000.

Grimsley, Ernest E. Portable boring and refinishing tool for end-loading ball valves. 4,463,633, Cl. 82-4.00R.

Gris, Arly. Foldable ladder. 4,463,829, Cl. 182-160.000.

Grossman, Kurt; and Bliesner, Jurgen, to Siemens Aktiengesellschaft. Arrangement for detachably connecting a wire to a circuit board conductor. 4,464,010, Cl. 339-272.00R.

Groudan, Alan I.; Pitt, Garry E.; and Barnes, Lell E., to Singer Company, The. High reliability memory. 4,464,747, Cl. 371-50.000.

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Shroot, Braham; Maignan, Jean; and Lang, Gerard, 4,464,301, Cl. 260-351.000.

Gruber, Bruce A., to Ashland Oil, Inc. Curable composition and use thereof. 4,464,521, Cl. 526-273.000.

Gruber, Heinz; Kutz, Johannes; and Moser, Manfred, to Kusters, Eduard. Method and apparatus for applying a pattern to a continuously advancing web of material. 4,463,467, Cl. 8-151.000.

Gruber, Robert J.; Julien, Paul C.; and Yourd, Raymond A., III, to Xerox Corporation. Developer compositions containing diaryl sulfonimides. 4,464,452, Cl. 430-110.000.

Gruber, Robert P., to United States of America, National Aeronautics and Space Administration. Simplified d.c. to d.c. converter. 4,464,710, Cl. 363-22.000.

Grund, Norbert: *See*—
Degen, Helmut; Dix, Johannes P.; Grund, Norbert; Hansen, Guenter; and Krallmann, Reinhold, 4,464,181, Cl. 8-639.000.

Gruner, Heiko: *See*—
Burger, Kurt; Friedrich, Heinz; Gruner, Heiko; Linn, Karl-Otto; and Zabler, Erich, 4,464,646, Cl. 338-25.000.

Grunerud, Orion L. Multi-roll dispenser. 4,463,912, Cl. 242-55.420.

GTE Automatic Electric Inc.: *See*—
Krikor, Krikor A., 4,464,748, Cl. 370-58.000.

GTE Business Communication Systems Inc.: *See*—
Kline, Samuel J.; and Little, Richard E., 4,464,543, Cl. 179-8.00R.

GTE Laboratories Incorporated: *See*—
Bellows, Alfred H., 4,464,641, Cl. 335-23.000.
Buhrer, Carl F., 4,464,133, Cl. 445-9.000.
Goldman, Ernest A.; McCarthy, Jeremiah P.; and Poppert, Paul E., 4,463,491, Cl. 29-571.000.

Guenther, Helmut: *See*—
Simon, Helmut; Bader, Johann; and Guenther, Helmut, 4,464,235, Cl. 204-73.00R.

Gueret, Jean-Louis H., to L'Oreal. Device for deep massage of the skin. 4,463,485, Cl. 128-62.00R.

Guidoboni, Enzo; Guidoboni, Paolo; and Guidoboni, Sergio, to Guidoboni, Laerte. Internal combustion engine. 4,463,566, Cl. 60-605.000.

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Guidoboni, Enzo; Guidoboni, Paolo; and Guidoboni, Sergio, 4,463,566, Cl. 60-605.000.

Guidoboni, Paolo: *See*—
Guidoboni, Enzo; Guidoboni, Paolo; and Guidoboni, Sergio, 4,463,566, Cl. 60-605.000.

Guidoboni, Sergio: *See*—
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Guild, John R., to Eastman Kodak Company. Development of light-sensitive quinone diazide compositions. 4,464,461, Cl. 430-326.000.

Gulsby Engineering, Inc.: *See*—
Gulsby, Jerry G., 4,464,190, Cl. 62-24.000.

Gulsby, Jerry G., to Gulsby Engineering, Inc. Hydrocarbon gas process. 4,464,190, Cl. 62-24.000.

Gurr, George P.; and Matheson, Frederick A., to Cyborex Laboratories, Inc. System and method for optimizing power shed/restore operations. 4,464,724, Cl. 364-492.000.

Gustilo, Ramon B. Compression bone screw. 4,463,753, Cl. 128-92.00B.

Gutierrez, Jorge G.: *See*—
Altman, Alan R.; and Gutierrez, Jorge G., 4,464,175, Cl. 604-99.000.

Gutsche, Henry W., to Monsanto Company. Process for increasing silicon thermal decomposition deposition rates from silicon halide-hydrogen reaction gases. 4,464,222, Cl. 156-613.000.

Haase, Charles A.: *See*—
Klungle, Mark C.; Haase, Charles A.; and Winsche, Martha J., 4,463,684, Cl. 108-91.000.

Hachisuka, Hiroshi; and Kuga, Fumiharu, to Aisin Seiki Kabushiki Kaisha. Power assisted steering mechanism. 4,463,820, Cl. 180-143.000.

Hadden, Clifford F. Radiator mounted condition sensing probe. 4,463,800, Cl. 165-11.00R.

Haemonetics Corporation: *See*—
Schoendorfer, Donald W.; and Hansen, Lee E., 4,464,167, Cl. 604-6.000.

Haffmans, Josef: *See*—
Berger, Rolf; Bonnen, Josef; Haffmans, Josef; Schafer, Max; Teetz, Wolfgang; and Gierse, Franzjosef, 4,463,692, Cl. 112-102.000.

Hafla, Dietmar; and Illi, Herbert, to Index-Werke Komm.-Ges. Hahn & Tessky. Steady for holding rod-like circular cross-section components. 4,463,635, Cl. 82-38.00R.

Hagemeyer, Gunter: *See*—
Vogt, Siegfried; Hagemeyer, Gunter; and Klopperpieper, Friedrich, 4,463,697, Cl. 112-262.300.

Hagenah, Klaus: *See*—
Leckband, Uwe; Thiele, Willi; Hagenah, Klaus; and Forster, Hans, 4,463,769, Cl. 131-109.0AB.

Hager, Daniel, to Ozen. Apparatus and method for injection moulding of plastic parts of irregular shape, hollow or undercut form. 4,464,324, Cl. 264-221.000.

Haghiri-Tehrani, Yahya: *See*—
Hoppe, Joachim; and Haghiri-Tehrani, Yahya, 4,463,971, Cl. 283-83.000.

Hains, Norman L., to Chemlime Corporation. Quicklime slaking process. 4,464,353, Cl. 423-640.000.

Halder, Franz: *See*—
Miller, Helmut; Baumann, Kurt; Halder, Franz; and Meystre, Noel, 4,464,580, Cl. 290-52.000.

Haldopoulois, Iaokim: *See*—
Dojki, Kassim H. V. M.; and Haldopoulois, Iaokim, 4,464,254, Cl. 210-136.000.

Halliburton Company: *See*—
Hollenbeak, Keith H.; and Githens, Charles J., 4,464,270, Cl. 252-8.55R.

Halter, Hartmut; and Schnell, Willi, to Reifenhauser GmbH & Co. Maschinenfabrik. Method of and apparatus for the coiling of flattened synthetic resin foil tubes. 4,464,319, Cl. 264-40.100.

Hamaguchi, Fumiko: *See*—
Ohki, Sadao; Hamaguchi, Fumiko; Nagasaka, Tatsuo; and Kikuchi, Hiroyuki, 4,464,361, Cl. 424-180.000.

Hamano, Isao; and Tanaka, Toshinori, to Mitsubishi Denki Kabushiki Kaisha. Field system of magnet type D.C. motor having magnetic flux reducing pole pieces. 4,464,595, Cl. 310-154.000.

Hamasaki, Robert H.: *See*—
Pogson, John T.; Shannon, Roger L.; Hamasaki, Robert H.; Franklin, James L.; Watkins, Dale F.; and Kramer, Ted J., 4,463,798, Cl. 165-1.000.

Hammer, Mordechai. Page-turning device. 4,463,651, Cl. 84-504.000.

Hammett, Roy, to Panamerican Closures, Inc. One-piece dispensing closure. 4,463,882, Cl. 222-543.000.

Hanaoka, Tadashi, to Citizen Watch Company Limited. Thermistor frequency controlled electronic thermometer. 4,464,067, Cl. 374-170.000.

Hanecka, Lubomir; and Hutter, Heinrich, to U.S. Philips Corporation. Helical scan recorder with three-point head mounting. 4,464,690, Cl. 360-84.000.

Haneda, Satoshi; Ito, Takashi; Nakamura, Ken; and Tomono, Makoto, to Konishiroku Photo Industry Co., Ltd. Developing apparatus. 4,464,041, Cl. 355-3.0DD.

Haney, Max A. Capillary bridge viscometer. 4,463,598, Cl. 73-55.000.

Hanft, Roy F.; and Pechanek, Gerald G., to International Business Machines Corporation. Multi-character display controller for text recorder. 4,464,070, Cl. 400-98.000.

Hanger, Thomas: *See*—
Fish, Leonard A.; and Hanger, Thomas, 4,464,787, Cl. 382-7.000.

Hannula, Donald L.: *See*—
Redmond, Russell J.; and Hannula, Donald L., 4,464,168, Cl. 604-9.000.

Hansen, Gerhard. Thermoplastic container. 4,463,862, Cl. 215-33.000.

Hansen, Guenter: *See*—
Degen, Helmut; Dix, Johannes P.; Grund, Norbert; Hansen, Guenter; and Krallmann, Reinhold, 4,464,181, Cl. 8-639.000.

Hansen, Lee E.: *See*—
Schoendorfer, Donald W.; and Hansen, Lee E., 4,464,167, Cl. 604-6.000.

Hansen, Peter: *See*—
Urner Wille, Marlies; and Hansen, Peter, 4,464,437, Cl. 428-458.000.

Hansen, Ralph H., to Canusa Coating Systems Limited. Thiodipropionoyl bis (halo benzhydrazide) additives for polymers. 4,464,240, Cl. 204-159.200.

Hanson, George N., to Eastern Safety Equipment Co., Inc. Protective helmet. 4,463,456, Cl. 2-416.000.

Hanson, Raymond F., to General Electric Company. Resonance selection circuit for series connection in a radio receiver circuit. 4,464,793, Cl. 455-154.000.

Hanson, Russell B.: *See*—
Hanson, Wallace A., Jr.; and Hanson, Russell B., 4,463,663, Cl. 92-80.000.

Hanson, Wallace A., Jr.; and Hanson, Russell B. Hydraulic cylinder assembly with a liquid recovery system. 4,463,663, Cl. 92-80.000.

Hara, Minoru: *See*—
Uchida, Tadahiro; Wakita, Hiizu; and Hara, Minoru, 4,464,161, Cl. 494-7.000.

Harada, Mineo; and Kako, Yutaka, to Hitachi, Ltd. Printing apparatus. 4,463,676, Cl. 101-212.000.

Harada, Naoki: *See*—
Omura, Takashi; Harada, Naoki; and Tezuka, Yasuo, 4,464,297, Cl. 260-185.000.

Hardinge Brothers, Inc.: *See*—
Lee, Richard C., 4,463,634, Cl. 82-34.00R.

Hardy Spicer Limited: *See*—
Bowyer, John T., 4,464,143, Cl. 464-146.000.

Hareng, Michel: *See*—
Le Berre, Serge; Hareng, Michel; Beguin, Annie; and Thirant, Lydie, 4,464,020, Cl. 350-350.00S.

Harris Corporation: *See*—
Eddins, W. T., 4,464,630, Cl. 330-107.000.
Prentice, John S., 4,464,631, Cl. 330-253.000.

Harris, Gerald R. Material-handling apparatus and method. 4,463,845, Cl. 198-341.000.

Harris, James E.: *See*—
Peil, William; Brown, Thomas A.; and Harris, James E., 4,464,607, Cl. 315-209.00R.

Harris, Jesse R.: *See*—
Kukes, Semyon G.; Harris, Jesse R.; and Banks, Robert L., 4,464,251, Cl. 208-221.000.

Harris-Thomas Drop Forge Company, The: *See*—
Theobald, Donald L., 4,463,590, Cl. 72-354.000.

Harrison, Anthony W., to Lucas Industries Limited. High pressure hydraulic systems. 4,463,969, Cl. 280-707.000.

Harrison, Kenneth J.; Raynes, Edward P.; Saunders, Frances C.; and Thompson, David J., to Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britian and Northern Ireland, The. Organic materials. 4,464,282, Cl. 252-299.100.

Hartley, James R.: *See*—
Reich, Ronald S.; Held, Jimmy L.; Munson, Arthur E.; and Hartley, James R., 4,463,496, Cl. 30-180.000.

Hartmann, Eduard: *See*—
Belde, Horst; Hartmann, Eduard; and Daubach, Ewald, 4,464,203, Cl. 106-308.00N.

Hartmann, Franz; and Heines, Gottfried, to Nordischer Maschinenbau Rud. Baader GmbH & Co KG. Device for shifting fish into position for decapitating. 4,463,478, Cl. 17-63.000.

Haruta, Masatoshi: *See*—
Fukuyama, Katsuhiro; Haruta, Masatoshi; and Takahashi, Takashi, 4,463,873, Cl. 221-12.000.

Harwood, Leopold A.; and Shanley, Robert L., II, to RCA Corporation. Amplifier incorporating gain distribution control for cascaded amplifying stages. 4,464,633, Cl. 330-254.000.

Hasegawa, Akira: *See*—
Kishida, Kazuo; Hasegawa, Akira; and Sugimori, Masahiro, 4,464,513, Cl. 525-227.000.

Hasegawa, Shinji; Toriyama, Kazuhisa; Pohl, Ludwig; and Weber, Georg, to Hitachi, Ltd.; and Merck Patent GmbH. Liquid crystal composition. 4,464,283, Cl. 252-299.630.

Hasenkamp, Rainer: *See*—
Andres, Johannes; Hasenkamp, Rainer; and Merkel, Heinrich, 4,464,202, Cl. 106-139.000.

Hashimoto, Hitoshi: *See*—
Saito, Yoshikuni; Hashimoto, Hitoshi; Arai, Isao; and Wada, Minoru, 4,463,490, Cl. 29-566.100.

Hashimoto, Masao; and Honda, Tadatoshi, to Mitsui Toatsu Chemicals, Inc. Process for producing α,β-unsaturated carboxylic acids or esters thereof. 4,464,539, Cl. 560-212.000.

Hashimoto, Shigeru: *See*—
Kato, Masatake; and Hashimoto, Shigeru, 4,464,023, Cl. 350-464.000.

Hasili, Jacob P., to RCA Corporation. Line cathode heating and protection circuit. 4,464,611, Cl. 315-366.000.

Haslberger, Richard: *See*—
Saalmann, Gunter; and Haslberger, Richard, 4,463,582, Cl. 68-17.00R.

Hatanaka, Masataka: *See*—
Ozawa, Kiyomi; Nakajima, Yasuyuki; Tsugeno, Makoto; Ishii, Shigeru; and Hatanaka, Masataka, 4,464,386, Cl. 424-273.00P.

Hatori, Masami; Ohkuma, Hiroaki; Konishi, Masataka; Miyaki, Takeo; and Kawaguchi, Hiroshi, to Bristol-Myers Company. Antitumor antibiotics produced by new streptomyces. 4,464,467, Cl. 435-119.000.

Hattori, Yoshihiro; Watanabe, Takashi; and Maeda, Kunio, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyacetal resin composition excellent in heat stability and surface processability and process for surface treating same. 4,464,435, Cl. 428-409.000.

Hauni-Werke Korber & Co. KG: *See*—
Leckband, Uwe; Thiele, Willi; Hagenah, Klaus; and Forster, Hans, 4,463,769, Cl. 131-109.0AB.
Quarella, Guido, 4,463,768, Cl. 131-84.00B.

Haus, Hermann A.; Glasser, Lance A.; and Ho, Ping-Tong, to Massachusetts Institute of Technology. Semiconductor diode laser system. 4,464,759, Cl. 372-18.000.

Hauser, Hans-Peter: *See*—
Nuesli, Armin; and Hauser, Hans-Peter, 4,464,708, Cl. 362-300.000.

Havenith, Cornelis: *See*—
Pischinger, Franz; and Havenith, Cornelis, 4,463,719, Cl. 123-276.000.

Hawie Mfg. Co., The: *See*—
Hawie, Robert L., 4,463,482, Cl. 24-489.000.

Hawie, Robert L., to Hawie Mfg. Co., The. Fastener. 4,463,482, Cl. 24-489.000.

Hawkins, James B.: *See*—
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Hudson, Wilbur G.; Webb, Tommy W.; Phillips, William S.; Tompa, Thomas J.; and Sanders, Edward, Jr., 4,463,669, Cl. 100-43.000.

Haworth, Inc.: *See*—
Klungle, Mark C.; Haase, Charles A.; and Winsche, Martha J., 4,463,684, Cl. 108-91.000.

Hayashi, Katsutake: *See*—
Ohta, Saburo; Nakamura, Shoji; Hayashi, Katsutake; Yomogida, Katsuyuki; Morohoshi, Hideo; Hirose, Seiichi; Uehara, Keiichi; Aizawa, Masanori; Sato, Yoshihisa; Ichikawa, Hideyuki; Tejima, Masayuki; and Togano, Seisaku, 4,464,290, Cl. 252-522.00R.

Hayashi, Kazuhiko: *See*—
Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, 4,463,822, Cl. 180-177.000.

Hayashi, Masaki: *See*—
Tanouchi, Tadao; Kawamura, Masanori; Ajima, Akio; Mohri, Tetsuya; Hayashi, Masaki; Terashima, Hiroshi; Hirata, Fumio; and Morimura, Takeshi, 4,464,382, Cl. 424-270.000.

Hayashi, Yoshimasa; and Shimada, Kiyoshi, to Nissan Motor Company, Limited. Vibration suppression system for diesel engine. 4,463,721, Cl. 123-378.000.

Hayes, Thomas J., to Buddy L Corporation. Reversible direction drive mechanism for toy vehicles. 4,463,519, Cl. 446-443.000.

Hayward, Wallace, Jr. Chambered rotary metering device. 4,463,736, Cl. 123-527.000.

Heckmann, Wolfgang; and Koslowski, Karl, to Klockner-Humboldt-Deutz AG. Separator. 4,464,163, Cl. 494-64.000.

Hegyi, Steven M.; and St. Jacques, Joseph A., to General Electric Company. Separable electric connector module with gas-actuated piston. 4,464,004, Cl. 339-111.000.
Heidelberger Druckmaschinen AG: *See*—
Rodi, Anton, 4,464,615, Cl. 318-625.000.
Heikkila, Risto M.: *See*—
Tuovines, Frans H.; Norrman, Bengt F.; Heikkila, Risto M.; and Honkaniemi, Matti E., 4,464,764, Cl. 373-87.000.
Heilman, Paul D.: *See*—
Benoit, Gordon L.; Donaldson, Jack J.; and Heilman, Paul D., 4,464,157, Cl. 493-211.000.
Heine, Otto R., to R & H Technology Inc. High capacity needle bearing for linear motion on a shaft. 4,463,992, Cl. 308-6.00C.
Heinemann, Otto; Baldus, Heinz-Dieter; and Schmits, Heinz-Herbert, to Krupp Polysius AG. Apparatus for introducing fine material into a combustion zone. 4,464,112, Cl. 432-106.000.
Heinen, Gottfried: *See*—
Hartmann, Franz; and Heinen, Gottfried, 4,463,478, Cl. 17-63.000.
Heinz Plastic Mold Co.: *See*—
Nagel, Dieter H., 4,463,867, Cl. 220-270.000.
Heise, Dieter: *See*—
Kludas, Martin; and Heise, Dieter, 4,464,362, Cl. 424-195.000.
Heiser, Joachim; and Kobald, Walter, to Robert Bosch GmbH. Arrangement for controlling the lifting mechanism of a tractor or a harvester combine. 4,463,658, Cl. 91-388.000.
Held, Jimmy L.: *See*—
Reich, Ronald S.; Held, Jimmy L.; Munson, Arthur E.; and Hartley, James R., 4,463,496, Cl. 30-180.000.
Helicopter Training Systems, Inc.: *See*—
Schoolcraft, Richard J., 4,464,116, Cl. 434-33.000.
Heller, Martin G.; Pecha, Edward; Smith, Douglas; and Rudder, Joel, to Heller, Martin G. Holding fixture and trimmer for PC boards. 4,463,636, Cl. 83-13.000.
Hellriegel, Edmund, to Ford Motor Company. Vehicle roof with a movable portion. 4,463,983, Cl. 296-213.000.
Helm, James H., to RCA Corporation. Video disc player having turntable retention mechanism. 4,464,744, Cl. 369-264.000.
Henderson, Earl E.: *See*—
Suhadolnik, Robert J.; Wu, Joseph M.; Doetsch, Paul; and Henderson, Earl E., 4,464,359, Cl. 424-180.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Andres, Johannes; Hasenkamp, Rainer; and Merkel, Heinrich, 4,464,202, Cl. 106-139.000.
Henning, Jerrold V., to Rockwell International Corporation. Squaring circuit bypass. 4,464,586, Cl. 307-271.000.
Hensarling, Thomas P.: *See*—
Jacks, Thomas J.; Hensarling, Thomas P.; and Muller, Linda L., 4,464,296, Cl. 260-123.500.
Hentzschel, Hanspeter; and Beck, Achim, to Eurosil GmbH. Microprocessor with resetting circuit arrangement. 4,464,584, Cl. 307-200.00A.
Her, Winn Shin. Electronic braking alarm indicator for automobiles. 4,464,649, Cl. 340-72.000.
Herchenbach, Paul; and Konrad, Mathias, to Jean Walterscheid GmbH. Coupling device for drive shafts. 4,464,077, Cl. 403-316.000.
Hercules Incorporated: *See*—
French, James E., 4,464,196, Cl. 75-0.5AA.
Gardiner, Richard J., 4,464,216, Cl. 156-162.000.
Hermann Wangner GmbH & Co., KG: *See*—
Borel, Georg, 4,463,782, Cl. 139-55.100.
Hermann, Wolfgang; Ruter, Bernhard; Gorris, Rainer; and Nowak, Herbert, to Rheinische Braunkohlenwerke AG; and Karrenh GmbH. Furnace chamber lining structure. 4,463,690, Cl. 110-336.000.
Herzing, Anthony G.; and Palamidis, Nickolas, to SCM Corporation. Confectionary coating compositions containing polyglycerol ester emulsifiers. 4,464,411, Cl. 426-613.000.
Hewlett, Kelvin J., to Crosby Valve and Engineering Company, Limited. Fluid pressure relief system actuator. 4,463,776, Cl. 137-495.000.
Hibbert, David B.: *See*—
Tseung, Alfred C. C.; Rasiyah, Nagendra P.; and Hibbert, David B., 4,464,239, Cl. 204-129.000.
Hickey, Lois G.: *See*—
Green, Sheldon R., 4,463,469, Cl. 15-98.000.
Hickey, Robert F.: *See*—
Owens, Roger W.; Hickey, Robert F.; and Capetanopoulos, Constantine, 4,464,262, Cl. 210-291.000.
Hickl, Anthony J.: *See*—
Kumar, Prabhat; Rivers, Ronald D.; and Hickl, Anthony J., 4,464,205, Cl. 148-11.50P.
Kumar, Prabhat; Rivers, Ronald D.; and Hickl, Anthony J., 4,464,206, Cl. 148-11.50P.
Higuchi, Takeru; Nishihata, Toshiaki; and Rytting, Howard J., to Merck & Co., Inc. Ajuvants for rectal delivery of drug substances. 4,464,363, Cl. 424-232.000.
Hildeman, Gregory J.; and Sanders, Robert E., Jr., to Aluminum Company of America. Aluminum powder alloy product for high temperature application. 4,464,199, Cl. 75-249.000.
Hilfman, Lee; and O'Hara, Mark J., to UOP Inc. Hydrocracking catalyst. 4,464,481, Cl. 502-228.000.
Hill, Donald G., to Dow Chemical Company, The. Process for fracturing subterranean formations. 4,463,810, Cl. 166-308.000.
Hillier, Edward; Graybill, Larry; Winders, Richard; Bridge, Dan; and Dauchy, Joe, to Rollins Environmental Services, Inc. Process and structure for storing and isolating hazardous waste. 4,464,081, Cl. 405-128.000.
Hillstrom, Thomas P.; Wilson, Robert J.; and Corwith, John T., to International Harvester Co. Tractor work lighting with automatic deluminizing control. 4,464,604, Cl. 315-79.000.
Hilti Aktiengesellschaft: *See*—
Leibhard, Erich, 4,464,076, Cl. 403-297.000.
Hilton, Graham H., to De La Rue Systems Limited. Apparatus for detecting the condition of a sheet. 4,463,607, Cl. 73-587.000.
Himmele, Walter: *See*—
Gramlich, Walter; Himmele, Walter; Martin, Christoph; Pommer, Ernst-Heinrich; and Siegel, Hardo, 4,464,370, Cl. 424-248.400.
Himmelstein, Sydney, to S. Himmelstein and Company. Energy efficient drive system. 4,463,629, Cl. 74-862.000.
Hirabayashi, Kenji; and Azegami, Hitoshi, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,464,433, Cl. 428-336.000.
Hiramoto, Tatsumi, to Ushio Denki Kabushikikaisha. Method of sterilization. 4,464,336, Cl. 422-24.000.
Hirano, Hitoshi: *See*—
Fukaya, Kastuyoshi; Tokuda, Akira; and Hirano, Hitoshi, 4,463,724, Cl. 123-438.000.
Hiraoka, Hiroyuki; Hofer, Donald C.; Miller, Robert D.; Pederson, Lester A.; and Willson, Carlton G., to International Business Machines Corporation. Process for making an imaged oxygen-reactive ion etch barrier. 4,464,460, Cl. 430-323.000.
Hirata, Fumio: *See*—
Tanouchi, Tadao; Kawamura, Masanori; Ajima, Akio; Mohri, Tetsuya; Hayashi, Masaki; Terashima, Hiroshi; Hirata, Fumio; and Morimura, Takeshi, 4,464,382, Cl. 424-270.000.
Hirose, Seiichi: *See*—
Ohta, Saburo; Nakamura, Shoji; Hayashi, Katsutake; Yomogida, Katsuyuki; Morohoshi, Hideo; Hirose, Seiichi; Uehara, Keiichi; Aizawa, Masanori; Sato, Yoshihisa; Ichikawa, Hideyuki; Tejima, Masayuki; and Togano, Seisaku, 4,464,290, Cl. 252-522.00R.
Hirschfeld, Tomas B., to United States of America, Energy. Infrared photoemitting diode having reduced work function. 4,464,572, Cl. 250-338.000.
Hirsh Company: *See*—
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 4,463,644, Cl. 83-745.000.
Hisaki, Hisao; Nagashima, Junnosuke; and Kanno, Katsuo, to Toray Industries, Inc. Friction-melt resistant textile product and preparing method thereof. 4,464,431, Cl. 428-266.000.
Hisatsune, Fumiyuki: *See*—
Yamagata, Shinji; Hisatsune, Fumiyuki; Terachi, Junichi; and Yoshiyasu, Hajimu, 4,464,642, Cl. 335-201.000.
Hitachi Electronics Engineering Co., Ltd.: *See*—
Takahashi, Kensaku; Yatsugake, Yasuo; Iwaya, Fukuo; Ito, Makoto; Takami, Katsumi; and Suda, Kyo, 4,464,011, Cl. 350-6.100.
Hitachi, Ltd.: *See*—
Asakura, Masamitsu, 4,463,596, Cl. 73-35.000.
Funada, Ryuichi; and Nakaya, Masato, 4,464,278, Cl. 252-62.540.
Harada, Mineo; and Kako, Yutaka, 4,463,676, Cl. 101-212.000.
Hasegawa, Shinji; Toriyama, Kazuhisa; Pohl, Ludwig; and Weber, Georg, 4,464,283, Cl. 252-299.630.
Machida, Shigeru; Tojo, Kenji; Ikegawa, Masato; and Shiibayashi, Masao, 4,464,100, Cl. 418-55.000.
Mikawa, Hiroji, 4,464,444, Cl. 429-13.000.
Munakata, Chusuke; Yagi, Kunihiro; and Motooka, Teruaki, 4,464,627, Cl. 324-158.00R.
Taguchi, Noriyuki; Fuzita, Tsuyoshi; Toda, Gyozo; Ishihara, Syoosaku; Kuroki, Takashi; and Suzuki, Tatsuhiro, 4,464,420, Cl. 427-96.000.
Takahashi, Kensaku; Yatsugake, Yasuo; Iwaya, Fukuo; Ito, Makoto; Takami, Katsumi; and Suda, Kyo, 4,464,011, Cl. 350-6.100.
Tanaka, Minoru; Ishizuka, Takeshi; and Shima, Kenzo, 4,463,744, Cl. 123-643.000.
Yoshizaki, Atsuhiro, 4,464,698, Cl. 361-79.000.
Hitachi Maxell, Ltd.: *See*—
Takagi, Hiroyoshi, 4,463,918, Cl. 242-199.000.
Hitachi Metals, Ltd.: *See*—
Taniguthi, Tatsuhito; Niwa, Yutaka; and Masumoto, Takashi, 4,463,777, Cl. 137-553.000.
Watanabe, Rikizo, 4,464,210, Cl. 148-162.000.
Hitchcock, William S.; and Stampfer, Joseph F., Jr., to University of Missouri, The Curators of the. Process for isotope separation. 4,464,343, Cl. 423-3.000.
Hittel, Gerhard; and Fiedler, Johann, to Karl Mayer Textilmaschinenfabrik GmbH. Weft insertion magazine with continuous provision of weft thread for a warp knitting machine. 4,463,580, Cl. 66-84.00A.
Ho, Paul F.: *See*—
Corona, Antonio; and Ho, Paul F., 4,463,788, Cl. 145-63.000.
Ho, Ping-Tong: *See*—
Haus, Hermann A.; Glasser, Lance A.; and Ho, Ping-Tong, 4,464,759, Cl. 372-18.000.
Hobbs, Donald A.; and Rowe, Geoffrey W., to University of Birmingham. Automatic measurement of areas. 4,463,600, Cl. 73-81.000.
Hodek, Werner, to Bergwerksverband GmbH. Method of increasing the oil yield from hydrogenation of coal. 4,464,245, Cl. 208-10.000.
Hodges, Robert V.: *See*—
Gorges, Friedrich J.; and Hodges, Robert V., 4,463,774, Cl. 137-81.100.
Hoechst Aktiengesellschaft: *See*—
Bosse, Dieter; Wingen, Rainer; Horn, Klaus; and Lutz, Walter, 4,464,457, Cl. 430-288.000.

Eberl, Karl; Engelmann, Manfred; and Fischer, Edgar, 4,464,516, Cl. 526-62.000.
Pium, Helmut, 4,464,522, Cl. 526-301.000.
Schoering, Eberhad, 4,464,035, Cl. 354-299.000.
Hoerauf, Werner: *See—*
Strehler, Hugo; Kegel, Robert; Valentin, Guenter; and Hoerauf, Werner, 4,464,266, Cl. 210-703.000.
Hoesch Werke Aktiengesellschaft: *See—*
Andree, Dietrich, 4,463,995, Cl. 308-207.00R.
Hofer, Donald C.: *See—*
Hiraoka, Hiroyuki; Hofer, Donald C.; Miller, Robert D.; Pederson, Lester A.; and Willson, Carlton G., 4,464,460, Cl. 430-323.000.
Hoffmann, Alexander: *See—*
Pusch, Gunter; and Hoffmann, Alexander, 4,463,653, Cl. 89-14.100.
Pusch, Gunther; Aislinger, Dieter E.; Hoffmann, Alexander; and Pusch, Klaus-Werner, 4,464,418, Cl. 427-44.000.
Hoffmann, Gerhard: *See—*
Bunger, Heinrich; Cordes, Rudolf; and Hoffmann, Gerhard, 4,464,477, Cl. 502-24.000.
Hoffmann-La Roche Inc.: *See—*
Borer, Rene; Gerecke, Max; and Kyburz, Emilio, 4,464,300, Cl. 260-245.500.
Hoffmann LaRoche Inc.: *See—*
Bollag, Werner, 4,464,394, Cl. 424-317.000.
Hofmann, Alan F., to University of California, The Regents of the. Octodiol, a solvent for direct dissolution of cholesterol gallstones. 4,464,399, Cl. 424-342.000.
Hofmeister, Helmut; Petzoldt, Karl; Annen, Klaus; Laurent, Henry; Wiechert, Rudolf; and Nishino, Yukeshige, to Schering Aktiengesellschaft. 11β-Chloro-Δ^{15}-steroids, a process for their preparation and pharmaceutical preparations containing them. 4,464,365, Cl. 424-243.000.
Holden, Clifford A. Composite action pulley. 4,464,150, Cl. 474-195.000.
Holdenried, Willy, to Zahnradfabrik Friedrichshafen, A.G. Hydrostatic transmission with inching control. 4,463,559, Cl. 60-444.000.
Holland Co.: *See—*
Murphy, Richard F.; and Murphy, Michael K., 4,463,835, Cl. 188-52.000.
Murphy, Richard F.; and Murphy, Michael K., 4,463,836, Cl. 188-52.000.
Hollenbeak, Keith H.; and Githens, Charles J., to Halliburton Company. Method and compositions for fracturing subterranean formations. 4,464,270, Cl. 252-8.55R.
Holliday, Arthur K.: *See—*
Mullin, John B.; Holliday, Arthur K.; Cole-Hamilton, David J.; and Jones, Anthony C., 4,464,233, Cl. 204-59.0QM.
Holm, William J., to W. H. Company, Inc. Fabric napping apparatus. 4,463,483, Cl. 26-29.00P.
Holmgren, Nils V., to McGraw-Edison Company. Apparatus for bonding and protecting electrical cable shields. 4,464,583, Cl. 307-147.000.
Holmstrom, Sven N. H., to Tetra Pak International A.B. Method of manufacturing parallelepipedic packing container provided with an opening arrangement. 4,464,156, Cl. 493-194.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Saito, Yoshikuni; Hashimoto, Hitoshi; Arai, Isao; and Wada, Minoru, 4,463,490, Cl. 29-566.100.
Takayanagi, Shinji; Kato, Yoshitaka; Nanno, Kunio; Yasunaga, Osamu; Takeuchi, Osamu; Yamamoto, Ryozo; Iwai, Kazuhiro; and Kasai, Hiroshi, 4,463,964, Cl. 280-284.000.
Tsuboi, Masaharu, 4,463,823, Cl. 180-226.000.
Yoshioka, Yuichi, 4,463,711, Cl. 123-52.0MV.
Zaita, Katsuyuki, 4,464,312, Cl. 261-70.000.
Honda Motor Co., Ltd.: *See—*
Kishi, Noriyuki, 4,463,730, Cl. 123-491.000.
Honda, Tadatoshi: *See—*
Hashimoto, Masao; and Honda, Tadatoshi, 4,464,539, Cl. 560-212.000.
Honda, Takeo: *See—*
Kobayashi, Shinsaku; Kamoshita, Katsuo; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Takashi; and Kojima, Mikio, 4,464,375, Cl. 424-251.000.
Honeywell Inc.: *See—*
Clark, Kim K., 4,464,732, Cl. 364-900.000.
Spethmann, Donald H.; and Emerson, Lucy T. Y., 4,463,574, Cl. 62-175.000.
Tromborg, Erik T., 4,464,756, Cl. 371-63.000.
Honeywell Information Systems Inc.: *See—*
Keeley, James W.; Fisher, Edwin P.; and Curley, John L., 4,464,717, Cl. 364-200.000.
Honkaniemi, Matti E.: *See—*
Tuovinen, Frans H.; Norrman, Bengt F.; Heikkila, Risto M.; and Honkaniemi, Matti E., 4,464,764, Cl. 373-87.000.
Hoogendoorn, Jan: *See—*
Rappoldt, Menso P.; Pauli, Louis F.; and Hoogendoorn, Jan, 4,464,298, Cl. 260-239.55C.
Hooper Trading Co.: *See—*
Fabricius, Hans-Ake; and Stahn, Roland, 4,464,355, Cl. 424-101.000.
Hoppe, Joachim; and Haghiri-Tehrani, Yahya, to Gao Gesellschaft fur Automation und Organisation mbH. Identification card having an IC module. 4,463,971, Cl. 283-83.000.
Horn, Klaus, to Industrie Automation Wage- und Prozesstechnik GmbH & Co. Process for a low back-action, quasi-hermetic covering of susceptible physical structures. 4,464,419, Cl. 427-58.000.
Horn, Klaus: *See—*
Bosse, Dieter; Wingen, Rainer; Horn, Klaus; and Lutz, Walter, 4,464,457, Cl. 430-288.000.
Horowitz, Ross M. Dual light source and fiber optic bundle illuminator. 4,464,705, Cl. 362-12.000.
Horstmeyer, Robert J.; and Weick, Larry J., to Advanced Drilling Corporation. Down-hole drilling apparatus. 4,463,814, Cl. 175-45.000.
Horton, Paul L., to Excelermatic Inc. Infinitely variable traction roller transmission. 4,463,620, Cl. 74-200.000.
Hosokawa, Yasuhiko; and Oniahi, Shunichiro, to Mitsubishi Denki Kabushiki Kaisha. Gate pulse phase shifter. 4,464,711, Cl. 363-87.000.
Hough, David L.: *See—*
Clemens, A. H.; and Hough, David L., 4,464,170, Cl. 604-50.000.
House, Roy F., to Venture Innovations, Inc. Organophilic clay suspending agents. 4,464,274, Cl. 252-28.000.
Howell, Robert G., to Corning Glass Works. Glass frits containing WO_3 or MoO_3 in RuO_2-based resistors. 4,464,421, Cl. 427-102.000.
Hsu, Jau Y., to Societe D'Assistance Technique Pour Produits Nestle S.A. Flavoring compositions. 4,464,407, Cl. 426-533.000.
Huang, Leeyuan, to Merck & Co., Inc. Antihypertensive compound 176. 4,464,395, Cl. 424-319.000.
Hubbard, Arthur L.; Copley, Russell D.; and Reichen, Ronald L., to Deere & Company. Cotton picker bar. 4,463,543, Cl. 56-44.000.
Huber, Charles D.: *See—*
Mailand, John J.; and Huber, Charles D., 4,463,523, Cl. 49-478.000.
Huber, Erich; and Huber, Johann, to Knorr-Bremse GmbH. Release valve apparatus for indirect air brakes of rail vehicles. 4,463,991, Cl. 303-69.000.
Huber, Johann: *See—*
Huber, Erich; and Huber, Johann, 4,463,991, Cl. 303-69.000.
Hubertz, Trond: *See—*
Berg, Terie; Hubertz, Trond; Kleiven, Erland; and Torblaa, Ivar, 4,463,987, Cl. 299-2.000.
Hudson, Wilbur G.: *See—*
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Hudson, Wilbur G.; Webb, Tommy W.; Phillips, William S.; Tompa, Thomas J.; and Sanders, Edward, Jr., 4,463,669, Cl. 100-43.000.
Huffman, Donald R.: *See—*
Sheets, Richard D.; and Huffman, Donald R., 4,464,398, Cl. 424-329.000.
Huffman, Stanley S.; Dorfman, Jan L.; Frenkel, Robert L.; and Pearce, Ronald A., to Adolph Coors Company. Apparatus and method for return of empty aluminum cans. 4,463,844, Cl. 194-4.00C.
Hughes Aircraft Company: *See—*
Gagnon, Ralph J., 4,464,018, Cl. 350-331.00R.
Gagnon, Ralph J., 4,464,019, Cl. 350-331.00R.
Lackner, Anna M.; Margerum, John D.; and Miller, Leroy J., 4,464,134, Cl. 445-24.000.
Nash, James G., 4,464,728, Cl. 364-786.000.
Huie, Jaken Y.; and Jacobus, Dan, to Sperry Corporation. Polyimide/-glass-epoxy/glass hybrid printed circuit board. 4,464,704, Cl. 361-414.000.
Huijser, Arie; Carasso, Marino G.; and Verboom, Johannes J., to U.S. Philips Corporation. System for transmitting digital information, coding arrangement for use in that system, decoding arrangement for use in that system and record carrier for use in that system. 4,464,714, Cl. 364-200.000.
Hulin, David K., to Medellec Limited. Development unit for dry silver recording paper. 4,464,561, Cl. 219-216.000.
Hull, Maury L., to University of California, The Regents of the. Method for programmed release in ski bindings. 4,463,968, Cl. 280-612.000.
Huntington Laboratories, Inc.: *See—*
Sheets, Richard D.; and Huffman, Donald R., 4,464,398, Cl. 424-329.000.
Hurd, Billy G., to Mobil Oil Corporation. Method for surfactant waterflooding in a high brine environment. 4,463,806, Cl. 166-274.000.
Hussain, Anwar A., to University of Kentucky Research Foundation. Method of administering narcotic antagonists and analgesics and novel dosage forms containing same. 4,464,378, Cl. 424-260.000.
Husson, Alan L.: *See—*
Ludwig, Richard H.; Dirnberger, Linus R.; and Husson, Alan L., 4,463,833, Cl. 187-29.00R.
Hutchison, Alan J., to Pfizer Inc. Imidazolidinedione derivatives. 4,464,380, Cl. 424-263.000.
Hutter, Heinrich: *See—*
Hanecka, Lubomir; and Hutter, Heinrich, 4,464,690, Cl. 360-84.000.
Huttlin, Herbert. Dragee-making drum. 4,463,703, Cl. 118-19.000.
Ichikawa, Hideyuki: *See—*
Ohta, Saburo; Nakamura, Shoji; Hayashi, Katsutake; Yomogida, Katsuyuki; Moroboshi, Hideo; Hirose, Seiichi; Uehara, Keiichi; Aizawa, Masanori; Sato, Yoshihisa; Ichikawa, Hideyuki; Tejima, Masayuki; and Togano, Seisaku, 4,464,290, Cl. 252-522.00R.
Ichikoh Industries Limited: *See—*
Wada, Yasuto, 4,464,017, Cl. 350-307.000.
ICI Americas Inc.: *See—*
Yellin, Tobias O.; Gilman, David J.; Jones, Derrick F.; and Oldham, Keith, 4,464,374, Cl. 424-251.000.
ICI Australia Limited: *See—*
Vasak, Vladimir; Sencar, Joze; and Mok, King K., 4,464,351, Cl. 423-486.000.
Idec Izumi Corporation: *See—*
Fujita, Teizo, 4,464,549, Cl. 200-42.00R.

Idel, Karsten: *See*—
Ostlinning, Edgar; and Idel, Karsten, 4,464,507, Cl. 524-710.000.
Iida, Kango. Hydraulic energy converter. 4,464,095, Cl. 416-128.000.
Ikeda, Tamon, to Sony Corporation. Induction heating apparatus with an override circuit. 4,464,553, Cl. 219-10.49R.
Ikegawa, Masato: *See*—
Machida, Shigeru; Tojo, Kenji; Ikegawa, Masato; and Shiibayashi, Masao, 4,464,100, Cl. 418-55.000.
Ikemoto, Yutaka: *See*—
Yoshida, Kunio; and Ikemoto, Yutaka, 4,464,059, Cl. 368-63.000.
Illi, Herbert: *See*—
Hafla, Dietmar; and Illi, Herbert, 4,463,635, Cl. 82-38.00R.
Imagawa, Noriyuki; and Utsunomiya, Nobu, to Toyo Seikan Kaisha, Ltd. Closure including an improved liner. 4,463,863, Cl. 215-343.000.
Imai, Yoshiro: *See*—
Nagai, Yataro; and Imai, Yoshiro, 4,463,957, Cl. 277-34.000.
Imaki, Katsuhiro: *See*—
Sakai, Yoshiki; Imaki, Katsuhiro; and Muryobayashi, Takashi, 4,464,388, Cl. 424-275.000.
IMI Marston Limited: *See*—
McDonald, Thomas J.; and Follows, Christopher, 4,464,442, Cl. 428-654.000.
Imperial Chemical Industries Limited: *See*—
Woolhouse, Robin A., 4,464,243, Cl. 204-257.000.
Imperial Chemical Industries PLC: *See*—
Boulton, Thomas W., 4,464,242, Cl. 204-253.000.
Cox, Michael T., 4,464,358, Cl. 424-177.000.
Doroszkowski, Andrew, 4,464,241, Cl. 204-181.00C.
Yellin, Tobias O.; Gilman, David J.; Jones, Derrick F.; and Oldham, Keith, 4,464,374, Cl. 424-251.000.
Imperial Clevite Inc.: *See*—
Arthur, Gene M., 4,464,146, Cl. 474-133.000.
In Situ Technology, Inc.: *See*—
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C., 4,463,807, Cl. 166-285.000.
Inage, Kuniyoshi. Battery powered time piece. 4,464,062, Cl. 368-220.000.
Incorvia, Samuel A.: *See*—
Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., 4,464,261, Cl. 210-282.000.
Index-Werke Komm.-Ges. Hahn & Tessky: *See*—
Hafla, Dietmar; and Illi, Herbert, 4,463,635, Cl. 82-38.00R.
Indiana Brass, Inc.: *See*—
Arnold, Don C.; and Wilcox, Thomas J., 4,463,460, Cl. 4-191.000.
Industrie Automation Wage- und Prozesstechnik GmbH & Co.: *See*—
Horn, Klaus, 4,464,419, Cl. 427-58.000.
Ingenior A.B. Berdal A/S: *See*—
Berg, Terie; Hubertz, Trond; Kleiven, Erland; and Torblaa, Ivar, 4,463,987, Cl. 299-2.000.
Ingenior Thor Furuholmen A/S: *See*—
Berg, Terie; Hubertz, Trond; Kleiven, Erland; and Torblaa, Ivar, 4,463,987, Cl. 299-2.000.
Ingre, Lars P.: *See*—
Forsberg, Gunnar S.; and Ingre, Lars P., 4,464,769, Cl. 375-110.000.
Inoue, Kentaro: *See*—
Kojima, Tadashi; Uchihama, Tetsuo; Tanaka, Kazuyoshi; Morozumi, Eiichi; Inoue, Kentaro; and Shito, Naomichi, 4,463,773, Cl. 137-38.000.
Inowa, Shigeru: *See*—
Omori, Kazuo; Tsuchiya, Hiroshi; Yamazaki, Yoshio; and Inowa, Shigeru, 4,464,042, Cl. 355-3.0SH.
Institut National da la Sante et de la Recherche Medicale - I.N.-S.E.R.M.: *See*—
Mennesson, Jean-Francois R., 4,463,817, Cl. .180-65.500.
Institut National de la Sante et de la Recherche Medicale: *See*—
Bisagni, Emile; Dubertret, Louis; Moron, Jacqueline; Averbeck, Dietrich; Papadopoulo, Dora; Blais, Jocelyne; Vigny, Paul; Schwencke, Maria N.; Moustacchi, Ethel; Nocentini, Silvano; and Zajdela, Francois, 4,464,354, Cl. 424-59.000.
Institute of Applied Biology Special Cancer Research Project: *See*—
Rubens, Harry E., 4,463,762, Cl. 128-633.000.
Instrumentation Laboratory Inc.: *See*—
Blecher, Jacob B., 4,463,616, Cl. 73-864.110.
Instytut Mechaniki Precyzyjnej: *See*—
Milewski, Witold; Brennek, Jerzy; Stanikowski, Lech; Kunicki, Wojciech; Sapiezynski, Wieslaw; Konopczynski, Andrzej; and Kondratowicz, Zbigniew, 4,464,414, Cl. 427-37.000.
Integrated Ceilings, Inc.: *See*—
Rodriquez, Daniel V.; and Daniels, Roger S., 4,463,537, Cl. 52-489.000.
Interlock Sicherheitssysteme: *See*—
Vogt, Werner, 4,464,454, Cl. 430-256.000.
International Business Machines Corporation: *See*—
Benhase, Michael T.; and Duke, Alan H., 4,464,713, Cl. 364-200.000.
Beraud, Jean-Paul; and Galand, Claude, 4,464,782, Cl. 381-31.000.
Beraud, Jean-Paul; Esteban, Daniel J.; and Galand, Claude, 4,464,783, Cl. 381-31.000.
Bhatia, Harsaran S.; and Riseman, Jacob, 4,464,212, Cl. 148-187.000.
Bird, David L., 4,464,655, Cl. 340-715.000.
Chen, Chin L., 4,464,753, Cl. 371-38.000.
Chow, Ming-Fea; Fredericks, Edward C.; and Moreau, Wayne M., 4,464,458, Cl. 430-312.000.
Dixon, Jerry D.; Farrell, Robert H.; Merckel, Gerald U.; Neely, Jack D.; Schmitt, Stephen A.; Verdoorn, William G., Jr.; and Bandy, Peter B., 4,464,718, Cl. 364-200.000.
Fletcher, Robert P., 4,464,712, Cl. 364-200.000.
Hanft, Roy F.; and Pechanek, Gerald G., 4,464,070, Cl. 400-98.000.
Hiraoka, Hiroyuki; Hofer, Donald C.; Miller, Robert D.; Pederson, Lester A.; and Willson, Carlton G., 4,464,460, Cl. 430-323.000.
Lawrence, Stephen G.; and Middleton, Brian H., 4,464,730, Cl. 364-900.000.
Roberts, Stanley; and Ryan, James G., 4,464,701, Cl. 361-313.000.
Stranko, Thomas A.; and Swann, Robert L., 4,464,751, Cl. 371-29.000.
International Flavors & Fragrances Inc.: *See*—
Boden, Richard M.; Tyszkiewicz, Theodore J.; and Watkins, Hugh, 4,464,280, Cl. 252-174.110.
Munteanu, Marina A.; Caeko, Christine; Oltarzewski, Edward S.; Lindauer, Jerome I.; and Withycombe, Donald A., 4,464,271, Cl. 252-8.600.
Pittet, Alan O.; Vock, Manfred H.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,464,408, Cl. 426-535.000.
Sprecker, Mark A.; and Whelan, Patrick, 4,464,291, Cl. 252-522.00R.
International Gas Detectors Limited: *See*—
Wilkinson-Tough, Gordon S., 4,464,339, Cl. 422-94.000.
International Harvester Co.: *See*—
Hillstrom, Thomas P.; Wilson, Robert J.; and Corwith, John T., 4,464,604, Cl. 315-79.000.
International Mechanite Metal Company Limited, The: *See*—
Mannion, Geoffrey; and Palmer, Patrick V., 4,464,198, Cl. 75-130.00R.
International Minerals & Chemical Corp.: *See*—
Kraemer, John F., 4,464,492, Cl. 523-139.000.
International Paper Company: *See*—
Nowacki, Ulrich G., 4,463,541, Cl. 53-447.000.
International Standard Electric Corporation: *See*—
Briese, Wolfgang, 4,464,599, Cl. 310-348.000.
International Telephone and Telegraph Corporation: *See*—
Turbak, Albin F.; Snyder, Fred W.; and Sandberg, Karen R., 4,464,287, Cl. 252-312.000.
Interstate Electronics Corp.: *See*—
Marentic, Michael J.; and Manseau, Daniel A., 4,464,657, Cl. 340-776.000.
Ionescu, Alexandru D., to New England Machinery, Inc. Bottle orienting apparatus. 4,463,846, Cl. 198-399.000.
Iorio Peretto, Sergio. Process for manufacturing a frame suitable for encasing a portion of an external wall and frames obtained thereof. 4,463,531, Cl. 52-204.000.
Irelan, John A., to Coachmen Industries, Inc. Retractable extension for a recreational vehicle. 4,463,982, Cl. 296-170.000.
Isaacs, Ralph M., to Northwest Alaskan Pipeline Company. Chilled gas pipeline installation and method. 4,464,082, Cl. 405-157.000.
Isackson, Dale F. Taps for dancing. 4,463,506, Cl. 36-113.000.
Ishida, Tokuji, to Minolta Camera Kabushiki Kaisha. Charge completion detecting device for flash photography system. 4,464,039, Cl. 354-418.000.
Ishihara, Syoosaku: *See*—
Taguchi, Noriyuki; Fuzita, Tsuyoshi; Toda, Gyozo; Ishihara, Syoosaku; Kuroki, Takashi; and Suzuki, Tatsuhiro, 4,464,420, Cl. 427-96.000.
Ishii, Shigeru: *See*—
Ozawa, Kiyomi; Nakajima, Yasuyuki; Tsugeno, Makoto; Ishii, Shigeru; and Hatanaka, Masataka, 4,464,386, Cl. 424-273.00P.
Ishitate, Yoshiyuki: *See*—
Kanazawa, Yukio; Takahashi, Toshikatsu; and Ishitate, Yoshiyuki, 4,464,046, Cl. 355-57.000.
Ishizuka, Takeshi: *See*—
Tanaka, Minoru; Ishizuka, Takeshi; and Shima, Kenzo, 4,463,744, Cl. 123-643.000.
Isitani, Shigeo: *See*—
Uchida, Masaaki; and Isitani, Shigeo, 4,464,244, Cl. 204-425.000.
Iso, Tadashi: *See*—
Iwao, Jun-ichi; Iso, Tadashi; and Oya, Masayuki, 4,464,371, Cl. 424-250.000.
Isobe, Toshiaki; and Sugita, Naoki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Electronic controlled non-synchronous fuel injecting method and device for internal combustion engines. 4,463,732, Cl. 123-492.000.
Itazawa, Masakatsu: *See*—
Makino, Tetsuya; Itazawa, Masakatsu; and Ogura, Kenzi, 4,464,517, Cl. 526-88.000.
Itek Corporation: *See*—
Greenleaf, Allen H.; and Milamed, Robert L., 4,463,560, Cl. 60-527.000.
Ito, Makoto: *See*—
Takahashi, Kensaku; Yatsugake, Yasuo; Iwaya, Fukuo; Ito, Makoto; Takami, Katsumi; and Suda, Kyo, 4,464,011, Cl. 350-6.100.
Ito, Takashi: *See*—
Haneda, Satoshi; Ito, Takashi; Nakamura, Ken; and Tomono, Makoto, 4,464,041, Cl. 355-3.0DD.
Itoh, Takaaki: *See*—
Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,464,311, Cl. 261-44.00C.
ITT Industries, Inc.: *See*—
Backes, Reiner; Schmidtpott, Friedrich; and Neal, Mathew, 4,464,773, Cl. 377-116.000.

Mlynek, Daniel, 4,464,729, Cl. 364-787.000.
Ivanov, Boris G.: *See—*
Ivanov, Nikolai A.; Ivanov, Boris G.; Zagoratsky, Leonid P.; Mitrofanov, Evgeny S.; Cherkassky, Vladimir A.; Finkelshtein, Georgy A.; Blekhman, Ilya I.; Barzukov, Oleg P.; Kaljunov, Gennady A.; Khinich, Isaak Y.; and Turkin, Vladimir Y., 4,463,908, Cl. 241-207.000.
Ivanov, Nikolai A.; Ivanov, Boris G.; Zagoratsky, Leonid P.; Mitrofanov, Evgeny S.; Cherkassky, Vladimir A.; Finkelshtein, Georgy A.; Blekhman, Ilya I.; Barzukov, Oleg P.; Kaljunov, Gennady A.; Khinich, Isaak Y.; and Turkin, Vladimir Y., to Vsesojuzny Nauchnoissledovatelsky I Proektny Institut Mekhanicheskoi Obrabotki Poleznykh Iskopaemykh. Device for clamping the adjustment ring of a cone crusher. 4,463,908, Cl. 241-207.000.
Iwabuchi, Takeshi; Morinaga, Hiroshi; Kawahara, Masao; Kamiyama, Sakae; Sato, Terumi; and Yokota, Muneto, to Nissan Chemical Industries, Ltd. Process for the polymerization or copolymerization of ethylene. 4,464,518, Cl. 526-127.000.
Iwai, Kazuhiro: *See—*
Takayanagi, Shinji; Kato, Yoshitaka; Nanno, Kunio; Yasunaga, Osamu; Takeuchi, Osamu; Yamamoto, Ryozo; Iwai, Kazuhiro; and Kasai, Hiroshi, 4,463,964, Cl. 280-284.000.
Iwao, Jun-ichi; Iso, Tadashi; and Oya, Masayuki, to Santen Pharmaceutical Co., Ltd. Five-membered heterocyclic compounds. 4,464,371, Cl. 424-250.000.
Iwashita, Tomonori; and Mashimo, Yukio, to Canon Kabushiki Kaisha. Connection arrangement for camera system components. 4,464,031, Cl. 354-173.100.
Iwata, Mikio: *See—*
Kawakami, Shigenao; Saka, Terumasa; Ura, Shigeru; Iwata, Mikio; Tokugawa, Yoshiharu; and Jinno, Naoyoshi, 4,464,505, Cl. 524-512.000.
Iwaya, Fukuo: *See—*
Takahashi, Kensaku; Yatsugake, Yasuo; Iwaya, Fukuo; Ito, Makoto; Takami, Katsumi; and Suda, Kyo, 4,464,011, Cl. 350-6.100.
Iyer, Bala S.: *See—*
Leshik, Richard R.; Iyer, Bala S.; and Carpenter, John R., 4,464,403, Cl. 426-271.000.
Izumi, Takao: *See—*
Takizawa, Kazuyuki; Izumi, Takao; and Kodama, Makoto, 4,464,743, Cl. 369-75.200.
J.B.M. Associates: *See—*
Meister, Jack B.; and Van Winkle, David W., 4,463,706, Cl. 119-51.00R.
J.I. Case Company: *See—*
Leonard, Emil T., 4,463,509, Cl. 37-193.000.
Jablonski, Daniel G., to United States of America, Navy. Semi-active notch filter. 4,464,637, Cl. 330-426.000.
Jaccard, Andre R., to Jaccard Corporation. Meat tenderizer. 4,463,476, Cl. 17-30.000.
Jaccard Corporation: *See—*
Jaccard, Andre R., 4,463,476, Cl. 17-30.000.
Jacks, Thomas J.; Hensarling, Thomas P.; and Muller, Linda L., to United States of America, Agriculture. Solubilization of dry protein in aqueous or acidic media after treatment with concentrated hydrogen peroxide. 4,464,296, Cl. 260-123.500.
Jackson, Robert E.; Crawford, Leroy A.; and Webb, Bryant F., to Sperry Corporation. Baler twine needle with break off tip portion. 4,463,668, Cl. 100-24.000.
Jacob Acker & Sohne: *See—*
Acker, Josef, 4,463,745, Cl. 124-6.000.
Jacob, Ezekiel J.: *See—*
Cooper, Sidney; and Jacob, Ezekiel J., 4,464,453, Cl. 430-126.000.
Jacobs, Martin L., to Uniroyal, Inc. Low smoke plasticized polyvinyl chloride. 4,464,502, Cl. 524-411.000.
Jacobs, Norman A.; and Madhav, Jagdish T., to Teletype Corporation. Method and apparatus for adjusting a facsimile document scanner. 4,464,681, Cl. 358-285.000.
Jacobs, Paul G. Vacuum cleaner. 4,463,474, Cl. 15-353.000.
Jacobus, Dan: *See—*
Huie, Jaken Y.; and Jacobus, Dan, 4,464,704, Cl. 361-414.000.
Jacottet, Jean-Louis, to Etablissements Paul Jacottet. Vibration jacks. 4,463,838, Cl. 188-299.000.
Jaedicke, Hagen: *See—*
Tonne, Peter; and Jaedicke, Hagen, 4,464,537, Cl. 548-211.000.
Jaeger, Eberhard: *See—*
Dost, Gerhard; Gerber, Walter; Jaeger, Eberhard; Moschter, Erwin; and Weiss, Richard, 4,464,432, Cl. 428-280.000.
Jakobsen, Kjell M.; and Nilsson, Claes T., to PLM Aktiebolag. Apparatus for the production of a blank for containers. 4,464,106, Cl. 425-525.000.
James, Barry R., to Merkle Engineers, Inc. High temperature furnace nose construction. 4,463,689, Cl. 110-334.000.
James River-Dixie/Northern, Inc.: *See—*
Pawlowski, Thomas D., 4,464,552, Cl. 206-569.000.
James, William G. Universal joint puller. 4,463,489, Cl. 29-259.000.
Jamieson, Donald R.: *See—*
Adams, Johnnie E.; and Jamieson, Donald R., 4,464,520, Cl. 526-262.000.
Janes, Norman F.: *See—*
Elliott, Michael; Janes, Norman F.; and Pulman, David A., 4,464,391, Cl. 424-304.000.
Janome Sewing Machine Co., Ltd.: *See—*
Sano, Yasuro, 4,463,694, Cl. 112-158.00A.
Janssen, Bernd; Meyer, Norbert; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, to BASF Aktiengesellschaft. Fungicides containing azolylmethyloxiranes. 4,464,381, Cl. 424-269.000.
Japan Electronic Industry Development Association: *See—*
Yokomizo, Yuji; Yuuki, Keiji; and Watanabe, Naoe, 4,464,647, Cl. 338-35.000.
Japan Styrene Paper Corporation: *See—*
Yoshimura, Shohei; and Kuwabara, Hideki, 4,464,484, Cl. 521-58.000.
Jaulmes, Philppe. Wide angle film shooting and projection of truncated images. 4,464,029, Cl. 352-69.000.
Jean Walterscheid GmbH: *See—*
Herchenbach, Paul; and Konrad, Mathias, 4,464,077, Cl. 403-316.000.
Konrad, Mathias; and Kampf, Klaus, 4,464,136, Cl. 464-14.000.
Jeffrey, David M.: *See—*
Thomas, David E.; Jeffrey, David M.; and Simms, David W., 4,464,626, Cl. 324-156.000.
Jennings, James, to Sperry Corporation. High speed counter circuit. 4,464,774, Cl. 377-117.000.
Jennings, Richard E., to Sperry Corporation. Clutch mechanism. 4,464,137, Cl. 464-48.000.
Jensen, Kaj. Simulator systems for interactive simulation of complex dynamic systems. 4,464,120, Cl. 434-219.000.
Jewett, Warren R. Intravenous fluid warmer. 4,464,563, Cl. 219-298.000.
Jinno, Naoyoshi: *See—*
Kawakami, Shigenao; Saka, Terumasa; Ura, Shigeru; Iwata, Mikio; Tokugawa, Yoshiharu; and Jinno, Naoyoshi, 4,464,505, Cl. 524-512.000.
Joffrion, Ralph K., to Copolymer Rubber & Chemical Corp. Process for dissolving EPM and EPDM polymers in oil. 4,464,493, Cl. 523-319.000.
Joh. Vaillant GmbH: *See—*
Kantner, Alexander, 4,463,570, Cl. 62-101.000.
Johanson, Edna L., executrix: *See—*
Bunce, Arthur; and Johanson, John E., deceased, 4,464,699, Cl. 361-296.000.
Johanson, John E., deceased: *See—*
Bunce, Arthur; and Johanson, John E., deceased, 4,464,699, Cl. 361-296.000.
Johanson Manufacturing Corporation: *See—*
Bunce, Arthur; and Johanson, John E., deceased, 4,464,699, Cl. 361-296.000.
John & E. Sturge Limited: *See—*
Parr, Stephen R.; and Frost, Geoffrey M., 4,464,469, Cl. 435-188.000.
Johnson, Everett A.: *See—*
Silverman, Daniel; and Johnson, Everett A., 4,464,566, Cl. 235-382.000.
Johnson, Jerrilyn J.; and Johnson, Paul B. Crab holder and cutter. 4,463,495, Cl. 30-142.000.
Johnson & Johnson Baby Products Company: *See—*
Dickover, William E.; Klasek, Ladislav J.; and Passafiume, Anthony, 4,464,217, Cl. 156-164.000.
Johnson, Leonard L., to Teco, Inc. Articulated aerial boom and an elbow linkage assembly therefore. 4,463,528, Cl. 52-114.000.
Johnson, Marvin F. L.: *See—*
Mooi, John; and Johnson, Marvin F. L., 4,464,249, Cl. 208-65.000.
Johnson Matthey Public Limited Company: *See—*
Bird, Alfred J.; and King, Frank, 4,464,482, Cl. 502-325.000.
Johnson, Paul B.: *See—*
Johnson, Jerrilyn J.; and Johnson, Paul B., 4,463,495, Cl. 30-142.000.
Johnson, Ronald L., to General Electric Company. Electric circuit controlling device and method of operating same. 4,464,551, Cl. 200-83.00P.
Jones, Anthony C.: *See—*
Mullin, John B.; Holliday, Arthur K.; Cole-Hamilton, David J.; and Jones, Anthony C., 4,464,233, Cl. 204-59.0QM.
Jones, Charles B., to Du Pont de Nemours, E. I., and Company. Image resolution. 4,464,667, Cl. 346-74.200.
Jones, Derrick F.: *See—*
Yellin, Tobias O.; Gilman, David J.; Jones, Derrick F.; and Oldham, Keith, 4,464,374, Cl. 424-251.000.
Jones, Donald W.: *See—*
Miller, Timothy J. E.; Jones, Donald W.; Richter, Eike; and Kalan, Gary L., 4,464,596, Cl. 310-156.000.
Jones, Merril. Log bundling apparatus. 4,463,667, Cl. 100-2.000.
Jordan, William R. Archery pod. 4,463,953, Cl. 273-418.000.
Joseph M. Herman Shoe Co., Inc.: *See—*
Duclos, Gary P., 4,463,505, Cl. 36-30.00R.
Joyce, William R., to Tex-Fab, Inc. Method and apparatus for forming a hem in fabric flat goods. 4,464,160, Cl. 493-448.000.
Joyner, Auvin H. Valve device for stock/sauce skimmer and the like. 4,464,265, Cl. 210-517.000.
Judd, Henry E.; Dowell, Arthur M., Jr.; and Rahman, Matiur, to Teepak, Inc. Sausage casing formed from regenerated cellulose with an internal vinyl acetate coating. 4,463,778, Cl. 138-118.100.
Julien, Paul C.: *See—*
Gruber, Robert J.; Julien, Paul C.; and Yourd, Raymond A., III, 4,464,452, Cl. 430-110.000.
Jurgens, Rainer; and Krehl, Dietmar, to Christensen, Inc. Mechanical jarring tool. 4,463,815, Cl. 175-302.000.

Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See*— Voigt, Hermann U.; and Schleese, Eckard. 4,464,425, Cl. 428-35.000.

Kabushiki Kaisha Kobe Seiko Sho: *See*— Asari, Akira; Noyori, Tatsuhiko; Tabuchi, Takahisa; Masuda, Tsuneharu; and Mizoguchi, Masao. 4,463,589, Cl. 72-273.500. Murase, Noriyoshi. 4,463,868, Cl. 220-288.000.

Kabushiki Kaisha Kubota Seisakusho: *See*— Uchida, Tadahiro; Wakita, Hiizu; and Hara, Minoru. 4,464,161, Cl. 494-7.000.

Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*— Mori, Shinji; Fujiwara, Akinori; and Kawaharazaki, Takashi. 4,463,917, Cl. 242-107.40A.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*— Shioda, Toshiyuki. 4,463,794, Cl. 164-182.000.

Kagawa, Kiyoto: *See*— Satake, Toshihiko; Kagawa, Kiyoto; and Ariji, Shigeru. 4,463,665, Cl. 99-488.000.

Kagdis, William A., deceased (by McKenzie, Claude F., executor), to Cluxton, Charles N. K. Loudspeaker system. 4,464,785, Cl. 381-117.000.

Kahl, James D., to Rexnord Inc. Sealed chain joint. 4,464,151, Cl. 474-231.000.

Kajita, Isamu; and Sumino, Fumio, to Canon Kabushiki Kaisha. Recording method having uniform exposure, charging, and infrared image exposure. 4,464,449, Cl. 430-54.000.

Kajita, Koji; Nakayama, Takashi; and Yamagata, Seiichi, to Toray Industries, Inc. Apparatus for making fasciated spun yarn. 4,463,549, Cl. 57-328.000.

Kajiwara, Hitoshi: *See*— Kaneko, Akio; and Kajiwara, Hitoshi. 4,464,781, Cl. 381-12.000.

Kako, Yutaka: *See*— Harada, Mineo; and Kako, Yutaka. 4,463,676, Cl. 101-212.000.

Kalan, Gary L.: *See*— Miller, Timothy J. E.; Jones, Donald W.; Richter, Eike; and Kalan, Gary L., 4,464,596, Cl. 310-156.000.

Kalaus, Gyorgy: *See*— Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Kreidl, Janos; Nemes, Andras; Farkas nee Kirjak, Maria; Visky, Gyorgy; and Czibula, Laszlo , 4,464,534, Cl. 546-51.000. Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Kreidl, Janos; Visky, Gyorgy; Nemes, Andras; Czibula, Laszlo ; and Farkas nee Kirjak, Maria, 4,464,535, Cl. 546-51.000.

Kalfs, Johannes J. W.: *See*— Snijders, Wilfred A. M.; Kalfs, Johannes J. W.; and Van Gerwen, Petrus J., 4,464,746, Cl. 370-32.000.

Kaljunov, Gennady A.: *See*— Ivanov, Nikolai A.; Ivanov, Boris G.; Zagoratsky, Leonid P.; Mitrofanov, Evgeny S.; Cherkassky, Vladimir A.; Finkelshtein, Georgy A.; Blekhman, Ilya I.; Barzukov, Oleg P.; Kaljunov, Gennady A.; Khinich, Isaak Y.; and Turkin, Vladimir Y., 4,463,908, Cl. 241-207.000.

Kalokhe, Shivdas A., to Ex-Cell-O Corporation. Pin lock cutting tool. 4,464,085, Cl. 407-105.000.

Kamimoto, Masayuki: *See*— Takahashi, Yoshio; Ozawa, Takeo; Sakamoto, Ryuji; Kanari, Katsuhiko; and Kamimoto, Masayuki. 4,463,799, Cl. 165-10.000.

Kamiya, Kenji, to Ricoh Watch Co., Ltd. Linearizer circuit and an electronic watch incorporating same. 4,464,061, Cl. 368-202.000.

Kamiyama, Sakae: *See*— Iwabuchi, Takeshi; Morinaga, Hiroshi; Kawahara, Masao; Kamiyama, Sakae; Sato, Terumi; and Yokota, Muneto. 4,464,518, Cl. 526-127.000.

Kamoshita, Katsuo: *See*— Kobayashi, Shinsaku; Kamoshita, Katsuo; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Takashi; and Kojima, Mikio. 4,464,375, Cl. 424-251.000.

Kampf, Klaus: *See*— Konrad, Mathias; and Kampf, Klaus. 4,464,136, Cl. 464-14.000.

Kanari, Katsuhiko: *See*— Takahashi, Yoshio; Ozawa, Takeo; Sakamoto, Ryuji; Kanari, Katsuhiko; and Kamimoto, Masayuki. 4,463,799, Cl. 165-10.000.

Kanayama, Tatsuo: *See*— Ueno, Ryuzo; Kanayama, Tatsuo; Tomiyasu, Kunihiko; Fujikami, Asao; and Nakashima, Toshitaka. 4,464,404, Cl. 426-332.000.

Kanazawa, Yukio; Takahashi, Toshikatsu; and Ishitate, Yoshiyuki, to Fuji Xerox Co., Ltd. Copying machine capable of continuously varying magnification. 4,464,046, Cl. 355-57.000.

Kanbe, Junichiro: *See*— Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji. 4,464,451, Cl. 430-65.000.

Kancylarz, John: *See*— Neigel, Dennis; and Kancylarz, John. 4,464,523, Cl. 527-300.000.

Kane, John F., to Armstrong World Industries, Inc. Pulse width modulated dimming arrangement for fluorescent lamps. 4,464,606, Cl. 315-158.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*— Ushioda, Minoru; Ueno, Kenji; and Kobayashi, Masahiro. 4,464,503, Cl. 524-425.000.

Kaneko, Akio; and Kajiwara, Hitoshi, to Alps Electric Co., Ltd. Equalizer apparatus. 4,464,781, Cl. 381-12.000.

Kaneko, Kenichi, to Aisin Seiki Kabushiki Kaisha. Adjustable bed. 4,463,463, Cl. 5-68.000.

Kaneko, Kyoichi, to Daiwa Seiko Inc. Bail arm reversing structure for spinning reels for fishing. 4,463,915, Cl. 242-84.20G.

Kaneko, Thomas M.; Dutton, Daniel R.; and Kim, Bongsub, to BASF Wyandotte Corporation. Anionic biocide emulsions in aqueous solutions of strongly ionizable salts. 4,464,193, Cl. 71-83.000.

Kannenberg, Daniel G.: *See*— Ford, David E., Jr.; and Kannenberg, Daniel G., 4,464,605, Cl. 315-134.000.

Kanno, Katsuo: *See*— Hisaki, Hisao; Nagashima, Junnosuke; and Kanno, Katsuo, 4,464,431, Cl. 428-266.000.

Kantner, Alexander, to Joh. Vaillant GmbH. Method of determining a set point for a temperature pressure controller of a heat pump. 4,463,570, Cl. 62-101.000.

Kaplan, Milton L., to UOP Inc. Parallel passage gas treating process. 4,464,350, Cl. 423-244.000.

Kapsen, Terrance J.: *See*— Anderson, Stephen T.; Anderson, Catherine A.; and Kapsen, Terrance J., 4,463,764, Cl. 128-719.000.

Kardon, Donald R. Method of making tamperproof bag closure. 4,464,158, Cl. 493-265.000.

Karickhoff, Michael, to Sherwin-Williams Company, The. Polymeric thickeners and coatings containing same. 4,464,524, Cl. 526-313.000.

Karl Mayer Textilmaschinenfabrik GmbH: *See*— Hittel, Gerhard; and Fiedler, Johann. 4,463,580, Cl. 66-84.00A.

Karl, Rupert; and Mayer, Walter, to Schubert & Salzer Maschinenfabrik Aktiengesellschaft. Pivotable suction tube for taking up a yarn from a bobbin. 4,463,548, Cl. 57-263.000.

Karras, Philip; and Ladson, Jack A., to Pacific Scientific Company. Colorimeter instrument with fiber optic ring illuminator. 4,464,054, Cl. 356-406.000.

Karrenh GmbH: *See*— Hermann, Wolfgang; Ruter, Bernhard; Gorris, Rainer; and Nowak, Herbert. 4,463,690, Cl. 110-336.000.

Karvinen, Mikko, to Valmet OY. Paper machine press with a wide pressing zone. 4,464,226, Cl. 162-358.000.

Kasai, Hiroshi: *See*— Takayanagi, Shinji; Kato, Yoshitaka; Nanno, Kunio; Yasunaga, Osamu; Takeuchi, Osamu; Yamamoto, Ryozo; Iwai, Kazuhiro; and Kasai, Hiroshi. 4,463,964, Cl. 280-284.000.

Kasanami, Toru: *See*— Senda, Atsuo; Kato, Suehiro; and Kasanami, Toru. 4,464,422, Cl. 427-124.000.

Kato, Kiichi; Sakamoto, Masaharu; Yoshikawa, Shoji; Yamamiya, Kunio; Kodama, Hiroshi; and Ohsima, Ken, to Olympus Optical Co., Ltd. Apparatus for detecting optically defects. 4,464,050, Cl. 356-237.000.

Kato, Masatake; and Hashimoto, Shigeru, to Canon Kabushiki Kaisha. Large relative aperture objective. 4,464,023, Cl. 350-464.000.

Kato, Mituo: *See*— Umemoto, Yoshiro; Sanmiya, Tsugumi; and Kato, Mituo, 4,464,499, Cl. 524-230.000.

Kato, Suehiro: *See*— Senda, Atsuo; Kato, Suehiro; and Kasanami, Toru, 4,464,422, Cl. 427-124.000.

Kato, Yoshitaka: *See*— Takayanagi, Shinji; Kato, Yoshitaka; Nanno, Kunio; Yasunaga, Osamu; Takeuchi, Osamu; Yamamoto, Ryozo; Iwai, Kazuhiro; and Kasai, Hiroshi, 4,463,964, Cl. 280-284.000.

Katou, Takashi: *See*— Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,464,311, Cl. 261-44.00C.

Kaule, Wittich; Schwenk, Gerhard; and Stenzel, Gerhard, to GAO Gesellschaft fuer Automation und Organisation mbH. Security paper having camouflage materials to protect its authenticity features. 4,463,970, Cl. 283-72.000.

Kawaguchi, Hiroshi: *See*— Hatori, Masami; Ohkuma, Hiroaki; Konishi, Masataka; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,464,467, Cl. 435-119.000.

Kawahara, Masao: *See*— Iwabuchi, Takeshi; Morinaga, Hiroshi; Kawahara, Masao; Kamiyama, Sakae; Sato, Terumi; and Yokota, Muneto, 4,464,518, Cl. 526-127.000.

Kawaharazaki, Takashi: *See*— Mori, Shinji; Fujiwara, Akinori; and Kawaharazaki, Takashi, 4,463,917, Cl. 242-107.40A.

Kawai, Yasuo: *See*— Yoshida, Shigeru; and Kawai, Yasuo, 4,464,692, Cl. 360-133.000.

Kawakami, Hiroshi: *See*— Nakada, Seiichi; Yoshikawa, Hiromi; Ohno, Hiroshi; Nishijima, Tsuneo; and Kawakami, Hiroshi, 4,463,473, Cl. 15-339.000.

Kawakami, Shigenao; Saka, Terumasa; Ura, Shigeru; Iwata, Mikio; Tokugawa, Yoshiharu; and Jinno, Naoyoshi, to Sumitomo Chemical Company, Limited. Coating composition for providing water and blister resistant, ink-receptive paper. 4,464,505, Cl. 524-512.000.

Kawamoto, Mutsumi; and Sakakibara, Shiro, to Aisin-Warner Kabushiki Kaisha. Belt type stepless shifter. 4,464,145, Cl. 474-28.000.

Kawamura, Masanori: *See*— Tanouchi, Tadao; Kawamura, Masanori; Ajima, Akio; Mohri, Tetsuya; Hayashi, Masaki; Terashima, Hiroshi; Hirata, Fumio; and Morimura, Takeshi, 4,464,382, Cl. 424-270.000.

Kay, David P.: *See*— Barnes, Alan C.; Kay, David P.; Kennewell, Peter D.; Parker, Frederick L.; and Rowlands, David A., 4,464,373, Cl. 424-250.000.

Kazaoka, Kenichi; Okuyama, Teiji; and Nishikawa, Masumi, to Aisin Seiki Kabushiki Kaisha. Tiltable steering apparatus for vehicles. 4,463,626, Cl. 74-493.000.

Kecseti, Frank: *See*—
Friedman, Evelyn; Borho, Martin A.; Carswell, William R.; and Kecseti, Frank, 4,463,874, Cl. 221-238.000.
Keeley, James W.; Fisher, Edwin P.; and Curley, John L., to Honeywell Information Systems Inc. Multilevel cache system with graceful degradation capability. 4,464,717, Cl. 364-200.000.
Kegel, Robert: *See*—
Strehler, Hugo; Kegel, Robert; Valentin, Guenter; and Hoerauf, Werner, 4,464,266, Cl. 210-703.000.
Kellerhals, Hanspeter: *See*—
Allemann, Martin; and Kellerhals, Hanspeter, 4,464,570, Cl. 250-291.000.
Kelley, Reginald D., to Force Control Industries, Inc. Multiple speed drive system. 4,463,841, Cl. 192-18.00A.
Kellogg, Harlan F. Knockdown fittings for knockdown furniture structure. 4,464,075, Cl. 403-231.000.
Kelman, Charles D. Intraocular lens and method of positioning the same in an eye. 4,463,457, Cl. 3-13.000.
Kennedy, Melvin: *See*—
Romero, Hugo; Arad, Avi; Nagel, Dietmar; and Kennedy, Melvin, 4,464,124, Cl. 434-321.000.
Kennedy, Ralph. Device for cutting a receptacle in pavement to receive plowable reflectors. 4,463,989, Cl. 299-39.000.
Kennewell, Peter D.: *See*—
Barnes, Alan C.; Kay, David P.; Kennewell, Peter D.; Parker, Frederick L.; and Rowlands, David A., 4,464,373, Cl. 424-250.000.
Kern, John M., to Borg-Warner Corporation. Metal power transmission belt. 4,464,152, Cl. 474-245.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Thiele, Dietrich, 4,464,294, Cl. 252-629.000.
Kerr, Douglas S.; and Lowe, Gerald A., to National Latex Products Company, The. Noisemaker device. 4,463,517, Cl. 446-421.000.
Kerscher, Utto: *See*—
Taubert, Rainer; and Kerscher, Utto, 4,464,501, Cl. 524-410.000.
Kershaw, Eli J. Nesting air filters. 4,464,187, Cl. 55-501.000.
Kharkovsky Politekhnichesky Institut: *See*—
Yantovsky, Leonid I.; Miroshnichenko, Anatoly G.; and Berzin, Evgeny K., 4,464,617, Cl. 318-717.000.
Khinich, Isaak Y.: *See*—
Ivanov, Nikolai A.; Ivanov, Boris G.; Zagoratsky, Leonid P.; Mitrofanov, Evgeny S.; Cherkassky, Vladimir A.; Finkelshtein, Georgy A.; Blekhman, Ilya I.; Barzukov, Oleg P.; Kaljunov, Gennady A.; Khinich, Isaak Y.; and Turkin, Vladimir Y., 4,463,908, Cl. 241-207.000.
Khoe, Giok D.; and Krahn, Friedrich, to U.S. Philips Corporation. Broad-band communication system comprising an optical broad-band cable network. 4,464,012, Cl. 350-96.160.
Kieliger, Josef: *See*—
Binninger, August; and Kieliger, Josef, 4,463,781, Cl. 139-1.00E.
Kikuchi, Hiroyuki: *See*—
Ohki, Sadao; Hamaguchi, Fumiko; Nagasaka, Tatsuo; and Kikuchi, Hiroyuki, 4,464,361, Cl. 424-180.000.
Killinger, Karl H., to Singer Company, The. Feeding mechanism for double pointed looper sewing machine. 4,463,695, Cl. 112-199.000.
Kim, Bongsub: *See*—
Kaneko, Thomas M.; Dutton, Daniel R.; and Kim, Bongsub, 4,464,193, Cl. 71-83.000.
Kim, Chulho: *See*—
Weimer, Raymond J.; and Kim, Chulho, 4,463,678, Cl. 102-307.000.
Kimberley, John A.: *See*—
Bullis, Robert H.; DiDomenico, Robert A.; Kimberley, John A.; McHugh, Thomas M.; Parent, Christopher A.; Voss, James R.; and Wiegand, Walter J., 4,463,729, Cl. 123-478.000.
Kimura, Kuniko; Ofuchi, Kunihiko; and Oda, Koichiro, to Mitsubishi Chemical Industries Limited. Skin care base material for external use. 4,464,400, Cl. 424-365.000.
Kindlimann, Lynn E., to Garrett Corporation, The. Dispersion strengthened ferritic stainless steel. 4,464,207, Cl. 148-16.600.
King, Frank: *See*—
Bird, Alfred J.; and King, Frank, 4,464,482, Cl. 502-325.000.
King, William M.; and Wight, William W., to Exxon Research & Engineering Co. Adhesive system for production of spiral wound membrane elements for use in organic fluid mixture separations. 4,464,494, Cl. 523-400.000.
Kiriake, Masaharu; and Shimano, Akira, to Murata Kikai Kabushiki Kaisha. Cop supplying system in automatic winder. 4,463,909, Cl. 242-35.50A.
Kirk, Alexis V., to Somersett Moon Ltd. Two part adjustable belt with locking means. 4,463,455, Cl. 2-338.000.
Kirsch, Wilhelm: *See*—
Ebert, Heinrich; Noe, Manfred; Wind, Kurt; and Kirsch, Wilhelm, 4,464,428, Cl. 428-95.000.
Kishi, Noriyuki, to Honda Motor Co., Ltd. Fuel supply control method for controlling fuel injection into an internal combustion engine in starting condition and accelerating condition. 4,463,730, Cl. 123-491.000.
Kishida, Kazuo; Hasegawa, Akira; and Sugimori, Masahiro, to Mitsubishi Rayon Company, Limited. Delustered thermoplastic resin composition. 4,464,513, Cl. 525-227.000.
Kishima, Noboru; Ueda, Yoshio; and Sato, Takeshi, to Toto, Ltd. Method of producing porous material having open pores. 4,464,485, Cl. 521-64.000.
Kiss, Laszlo : *See*—
Kocsis, Jozsef K.; Kiss, Laszlo ; Balajthy, Zoltan; Nagy, Peter; Pai nee Hazkoto, Gizella; Zarubai, Miklos; Sipos, Geza; Romhanyi, Andras; and Kokai, Rudolf, 4,464,504, Cl. 524-443.000.
Kissam, Allan D., to United States of America, Commerce. Acoustic thawing of frozen food. 4,464,401, Cl. 426-238.000.
Kitagawa, Junji; Akita, Shigeyuki; and Kitamura, Sotoo, to Nippon Soken, Inc. Liquid quantity detecting apparatus. 4,463,604, Cl. 73-296.000.
Kitakohji, Toshisuke: *See*—
Yoneda, Yasuhiro; Kitamura, Kenroh; Naito, Jiro; and Kitakohji, Toshisuke, 4,464,455, Cl. 430-270.000.
Kitamura, Kenroh: *See*—
Yoneda, Yasuhiro; Kitamura, Kenroh; Naito, Jiro; and Kitakohji, Toshisuke, 4,464,455, Cl. 430-270.000.
Kitamura, Sotoo: *See*—
Kitagawa, Junji; Akita, Shigeyuki; and Kitamura, Sotoo, 4,463,604, Cl. 73-296.000.
Kiuchi, Masayoshi; Uchidoi, Masanori; and Urushihara, Kazunobu, to Canon Kabushiki Kaisha. Exposure time control device. 4,464,032, Cl. 354-234.100.
Klasek, Ladislav J.: *See*—
Dickover, William E.; Klasek, Ladislav J.; and Passafiume, Anthony, 4,464,217, Cl. 156-164.000.
Kleban, Janos: *See*—
Czvikovszky, Tibor J.; Pazonyi, Tamas; Topolcai, Laszlone I.; and Kleban, Janos, 4,464,510, Cl. 525-54.230.
Klein, Richard G., to B. F. Goodrich Company, The. Time independent logic system for rip detectors. 4,464,654, Cl. 340-676.000.
Klein, Siegfried. Corona-effect sound emitter. 4,464,544, Cl. 179-113.000.
Kleiven, Erland: *See*—
Berg, Terje; Hubertz, Trond; Kleiven, Erland; and Torblaa, Ivar, 4,463,987, Cl. 299-2.000.
Kliklok Corporation: *See*—
Collura, Peter C.; Goda, Boyd D.; and Palagi, Harvey N., 4,464,155, Cl. 493-137.000.
Kline, Samuel J.; and Little, Richard E., to GTE Business Communication Systems Inc. Network control center call trace. 4,464,543, Cl. 179-8.00R.
Klinge, Gerd: *See*—
Upmeier, Hartmut; Klinge, Gerd; and Winkler, Gerhard, 4,464,318, Cl. 264-40.100.
Klockner-Humboldt-Deutz AG: *See*—
Heckmann, Wolfgang; and Koslowski, Karl, 4,464,163, Cl. 494-64.000.
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Pluequet, Heinz, 4,463,709, Cl. 123-41.500.
Kloenne, Amy E.: *See*—
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Kludas, Martin; and Heise, Dieter, to Estee Lauder Inc. Topical skin repair composition. 4,464,362, Cl. 424-195.000.
Klungle, Mark C.; Haase, Charles A.; and Winsche, Martha J., to Haworth, Inc. Horizontal shelf unit for handling papers. 4,463,684, Cl. 108-91.000.
Kluth, Hans-Jurgen, to Licentia Patent-Verwaltungs-GmbH. Video recorder providing transient-free audio signals. 4,464,684, Cl. 358-310.000.
Klyn, Edward D. Universal lagging. 4,464,149, Cl. 474-185.000.
Knickerbocker, Robert H., to Siemon Company, The. Electrical connector hold-down adaptor. 4,463,999, Cl. 339-75.00P.
Knight, William W.: *See*—
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Gale, Michael T.; and Knop, Karl H., 4,464,030, Cl. 354-4.000.
Knorr-Bremse GmbH: *See*—
Huber, Erich; and Huber, Johann, 4,463,991, Cl. 303-69.000.
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Christopfel, William C.; and Knowles, William S., 4,464,306, Cl. 260-429.00J.
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Pickett, David M.; Knutson, Richard K.; and VonFeldt, William, 4,463,701, Cl. 114-245.000.
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Heiser, Joachim; and Kobald, Walter, 4,463,658, Cl. 91-388.000.
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Kojima, Tetsuro; and Kobayashi, Hidetoshi, 4,464,463, Cl. 430-512.000.

Takita, Hitoshi; Mukaida, Yutaka; Noda, Sakuo; and Kobayashi, Hidetoshi, 4,464,396, Cl. 424-319.000.

Kobayashi, Junichi: *See*—
Etoh, Satoshi; Kobayashi, Junichi; and Tanimoto, Kenji, 4,464,682, Cl. 358-288.000.

Kobayashi, Masahiro: *See*—
Ushioda, Minoru; Ueno, Kenji; and Kobayashi, Masahiro, 4,464,503, Cl. 524-425.000.

Kobayashi, Shinichiro: *See*—
Murase, Kiyoshi; Mase, Toshiyasu; Arima, Hideki; Niigata, Kunihiro; Tomioka, Kenichi; and Kobayashi, Shinichiro, 4,464,384, Cl. 424-270.000.

Kobayashi, Shinsaku; Kamoshita, Katsuo; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Takashi; and Kojima, Mikio, to Sankyo Co., Ltd.; and Ube Industries Ltd. 4-Anilinoquinazoline compounds and pharmaceutical compositions thereof. 4,464,375, Cl. 424-251.000.

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Kobayashi, Tatsuo, to Toyota Jidosha Kabushiki Kaisha. Engine knock sensor. 4,463,722, Cl. 123-425.000.

Kobayashi, Yasuo: *See*—
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Kochansky, Jan; and Wright, Fred C., to United States of America, Agriculture. Control of parasitic mites with alkyl carbamates. 4,464,390, Cl. 424-300.000.

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Vogt, Siegfried; Hagemeyer, Gunter; and Klopperpieper, Friedrich, 4,463,697, Cl. 112-262.300.

Kocsis, Jozsef K.; Kiss, Laszlo ; Balajthy, Zoltan; Nagy, Peter; Pai nee Hazkoto, Gizella; Zarubai, Miklos; Sipos, Geza; Romhanyi, Andras; and Kokai, Rudolf, to Muanyagipari Kutato Intezet and Hutogepgyar. Freon-corrosion, impact and cold resistant flame-retardant polystyrene blend containing zeolites having cation(s) of Mg, Co, Sb, or Mo. 4,464,504, Cl. 524-443.000.

Kocsis, Karoly: *See*—
Wehrli, Hansuli; Kocsis, Karoly; and Scartazzini, Riccardo, 4,464,366, Cl. 424-246.000.

Kodama, Hiroshi: *See*—
Kato, Kiichi; Sakamoto, Masaharu; Yoshikawa, Shoji; Yamamiya, Kunio; Kodama, Hiroshi; and Ohsima, Ken, 4,464,050, Cl. 356-237.000.

Kodama, Makoto: *See*—
Takizawa, Kazuyuki; Izumi, Takao; and Kodama, Makoto, 4,464,743, Cl. 369-75.200.

Kofink, Wolfgang, to Robert Bosch GmbH. Liquid cooled commutation-type dynamo electric machine. 4,464,593, Cl. 310-58.000.

Kohle Energy Research Consultants Inc.: *See*—
Sanda, Joseph, 4,464,246, Cl. 208-11.0LE.

Kohmoto, Shinsuke: *See*—
Okura, Zenichi; and Kohmoto, Shinsuke, 4,464,040, Cl. 354-455.000.

Kojima, Mikio: *See*—
Kobayashi, Shinsaku; Kamoshita, Katsuo; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Takashi; and Kojima, Mikio, 4,464,375, Cl. 424-251.000.

Kojima, Tadashi; Uchihama, Tetsuo; Tanaka, Kazuyoshi; Morozumi, Eiichi; Inoue, Kentaro; and Shito, Naomichi, to Yamatake-Honeywell Co., Ltd. Safety shut-off valve. 4,463,773, Cl. 137-38.000.

Kojima, Tetsuro; and Kobayashi, Hidetoshi, to Fuji Photo Film Co., Ltd. Silver halide color photographic light-sensitive material. 4,464,463, Cl. 430-512.000.

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Sugimoto, Naohiko; Kojima, Tetsuro; and Mukunoki, Yasuo, 4,464,462, Cl. 430-512.000.

Kokai, Rudolf: *See*—
Kocsis, Jozsef K.; Kiss, Laszlo ; Balajthy, Zoltan; Nagy, Peter; Pai nee Hazkoto, Gizella; Zarubai, Miklos; Sipos, Geza; Romhanyi, Andras; and Kokai, Rudolf, 4,464,504, Cl. 524-443.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Watanabe, Fumio; and Mizuguchi, Yoshihiko, 4,464,666, Cl. 343-781.00P.

Komai, Hiromichi; and Ameyama, Minoru, to Ricoh Company, Ltd. Ink supply system of ink jet recording apparatus. 4,464,668, Cl. 346-75.000.

Komatsu, Toshiyuki: *See*—
Koumura, Noboru; Komatsu, Toshiyuki; Nakagawa, Katsumi; Takekawa, Nobuhiro; and Fujii, Motoharu, 4,464,043, Cl. 355-14.00C.

Kommoss, Klaus; and Schutte, Valentin H., to U.S. Philips Corporation. Magnetic tape cassette apparatus having an over-travel pushbutton movement. 4,464,695, Cl. 360-137.000.

Kondo, Hiroatsu: *See*—
Nozaki, Mineo; Ozawa, Toshiaki; Asakura, Osamu; Kondo, Hiroatsu; and Okamura, Shigeru, 4,463,672, Cl. 101-93.090.
Yamada, Yasuaki; Ozawa, Toshiaki; and Kondo, Hiroatsu, 4,464,069, Cl. 400-83.000.

Kondo, Makoto, to Olympus Optical Co., Ltd. Tape recorder. 4,464,694, Cl. 360-137.000.

Kondo, Masao; and Kumano, Shinji, to Nippon Gakki Seizo Kabushiki Kaisha. Method of producing multi-key structure for keyboard musical instruments. 4,464,325, Cl. 264-229.000.

Kondo, Toshio: *See*—
Sagisaka, Yasuo; Fukue, Naofumi; and Kondo, Toshio, 4,463,740, Cl. 123-568.000.

Kondratowicz, Zbigniew: *See*—
Milewski, Witold; Brennek, Jerzy; Stanikowski, Lech; Kunicki, Wojciech; Sapiezynski, Wieslaw; Konopczynski, Andrzej; and Kondratowicz, Zbigniew, 4,464,414, Cl. 427-37.000.

Koninger, Josef: *See*—
Schimko, Reinhold; and Koninger, Josef, 4,463,577, Cl. 66-64.000.

Konishi, Masataka: *See*—
Hatori, Masami; Ohkuma, Hiroaki; Konishi, Masataka; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,464,467, Cl. 435-119.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Arai, Mitutaka, 4,464,279, Cl. 252-62.540.
Haneda, Satoshi; Ito, Takashi; Nakamura, Ken; and Tomono, Makoto, 4,464,041, Cl. 355-3.0DD.
Omori, Kazuo; Tsuchiya, Hiroshi; Yamazaki, Yoshio; and Inowa, Shigeru, 4,464,042, Cl. 355-3.0SH.

Konno, Tatsuo: *See*—
Fujino, Masahisa; Sunouchi, Akio; Konno, Tatsuo; and Suzuki, Ryuji, 4,464,033, Cl. 354-266.000.

Konopczynski, Andrzej: *See*—
Milewski, Witold; Brennek, Jerzy; Stanikowski, Lech; Kunicki, Wojciech; Sapiezynski, Wieslaw; Konopczynski, Andrzej; and Kondratowicz, Zbigniew, 4,464,414, Cl. 427-37.000.

Konrad, Mathias; and Kampf, Klaus, to Jean Walterscheid GmbH. Lubricated wide angle universal joint. 4,464,136, Cl. 464-14.000.

Konrad, Mathias: *See*—
Herchenbach, Paul; and Konrad, Mathias, 4,464,077, Cl. 403-316.000.

Korenyak, Nikolai K.: *See*—
Surovikin, Vitaly F.; Antonenko, Vladimir F.; Babich, Gennady V.; Bobrik, Mikhail Y.; Korenyak, Nikolai K.; Novikov, Vasily V.; Voloshin, Gennady A.; Belyaev, Georgy A.; Gordeev, Alexandr V.; Gallyamov, Nail I.; and Krikunenko, Anatoly F., 4,464,314, Cl. 261-79.00A.

Korenyi, Donald. Combustion apparatus. 4,464,108, Cl. 431-265.000.

Korshunov, Evgeny A.; Kuznetsov, Alexandr N.; Ovodenko, Maxim B.; Kuzmin, Gennady G.; Kostrov, Valery P.; Timofeev, Alexandr N.; Bastrikov, Valery L.; and Meschaninova, Tatyana V. Continuous metal casting method and plant for performing same. 4,463,796, Cl. 164-460.000.

Kortmann, Wilfried: *See*—
Alberts, Heinrich; Steinberger, Helmut; and Kortmann, Wilfried, 4,464,506, Cl. 524-588.000.

Kosa, Bruce G., to Rogers Corporation. Nylon foam. 4,464,491, Cl. 521-134.000.

Koslowski, Karl: *See*—
Heckmann, Wolfgang; and Koslowski, Karl, 4,464,163, Cl. 494-64.000.

Kosmatka, Walter J.; and Zalar, Frank E., to General Electric Company. Lamp unit having accurately positioned filament. 4,464,600, Cl. 313-318.000.

Kostrov, Valery P.: *See*—
Korshunov, Evgeny A.; Kuznetsov, Alexandr N.; Ovodenko, Maxim B.; Kuzmin, Gennady G.; Kostrov, Valery P.; Timofeev, Alexandr N.; Bastrikov, Valery L.; and Meschaninova, Tatyana V., 4,463,796, Cl. 164-460.000.

Kotov, Boris A.: *See*—
Vildgrube, Georgy S.; Kutuzov, Boris N.; Sokolsky, Valery N.; Missulovin, Leon Y.; and Kotov, Boris A., 4,464,119, Cl. 434-185.000.

Kouge, Shinichi: *See*—
Matsumoto, Akio; Morishita, Mitsuharu; Yokota, Mitsuyoshi; and Kouge, Shinichi, 4,464,594, Cl. 310-63.000.

Koumura, Noboru; Komatsu, Toshiyuki; Nakagawa, Katsumi; Takekawa, Nobuhiro; and Fujii, Motoharu, to Canon Kabushiki Kaisha. Automatic printing apparatus. 4,464,043, Cl. 355-14.00C.

Kourtides, Demetrius A.: *See*—
Parker, John A.; and Kourtides, Demetrius A., 4,463,465, Cl. 5-459.000.

Koyano, Akira; and Mizuno, Seiichiro, to Aloka Co., Ltd. Ultrasonic compound scanning diagnostic apparatus. 4,463,763, Cl. 128-661.000.

Koyo Seiko Co., Ltd.: *See*—
Yasui, Hiroyoshi, 4,464,275, Cl. 252-32.70E.

Kraemer, John F., to International Minerals & Chemical Corp. Foundry binder. 4,464,492, Cl. 523-139.000.

Krahn, Friedrich: *See*—
Khoe, Giok D.; and Krahn, Friedrich, 4,464,012, Cl. 350-96.160.

Krallmann, Reinhold: *See*—
Degen, Helmut; Dix, Johannes P.; Grund, Norbert; Hansen, Guenter; and Krallmann, Reinhold, 4,464,181, Cl. 8-639.000.

Kramer, Hans; Zahir, Sheik A.; and Forster, Ewald, to Ciba-Geigy Corporation. Foams of silicates and poly(meth)acrylic acids. 4,464,486, Cl. 521-83.000.

Kramer, Steven G.; and Yavitz, Edward Q., to University of California, The Regents of the. Medicine drop dispenser with anti-bacterial filter. 4,463,880, Cl. 222-189.000.

Kramer, Ted J.: *See*—
Pogson, John T.; Shannon, Roger L.; Hamasaki, Robert H.; Franklin, James L.; Watkins, Dale F.; and Kramer, Ted J., 4,463,798, Cl. 165-1.000.

Krass, Dennis K.; and Richter, Sidney B., to PPG Industries, Inc. Herbicidally active quinoline or quinoxaline benzoate derivatives. 4,464,533, Cl. 544-354.000.

Krauss-Maffei Aktiengesellschaft: *See*—
Schmitz, Horst; and Krompass, Wolfgang, 4,464,056, Cl. 366-134.000.

Krehbiel, Robert D., to Cessna Aircraft Company, The. Rephasing cylinder construction. 4,463,563, Cl. 60-593.000.

Krehl, Dietmar: *See*—
Jurgens, Rainer; and Krehl, Dietmar, 4,463,815, Cl. 175-302.000.

Kreidl, Janos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Kreidl, Janos; Nemes, Andras; Farkas nee Kirjak, Maria; Visky, Gyorgy; and Czibula, Laszlo , 4,464,534, Cl. 546-51.000.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Kreidl, Janos; Visky, Gyorgy; Nemes, Andras; Czibula, Laszlo ; and Farkas nee Kirjak, Maria, 4,464,535, Cl. 546-51.000.

Kretschmer, Frank F., Jr.: *See*—
Lewis, Bernard L.; and Kretschmer, Frank F., Jr., 4,464,768, Cl. 375-101.000.

Krieger, Robert R. Linear bearing insert for firearm slide. 4,463,655, Cl. 89-196.000.

Krikor, Krikor A., to GTE Automatic Electric Inc. Remote data link switching arrangement. 4,464,748, Cl. 370-58.000.

Krikunenko, Anatoly F.: *See*—
Surovikin, Vitaly F.; Antonenko, Vladimir F.; Babich, Gennady V.; Bobrik, Mikhail Y.; Korenyak, Nikolai K.; Novikov, Vasily V.; Voloshin, Gennady A.; Belyaev, Georgy A.; Gordeev, Alexandr V.; Gallyamov, Nail I.; and Krikunenko, Anatoly F., 4,464,314, Cl. 261-79.00A.

Kroeger, Ingo; and Wuerzer, Bruno, to BASF Aktiengesellschaft. Herbicidal agents based on N-(3,4-dichlorophenyl)-N'methoxy-N'-methylurea and benzothiadiazinone dioxides. 4,464,195, Cl. 71-91.000.

Krompass, Wolfgang: *See*—
Schmitz, Horst; and Krompass, Wolfgang, 4,464,056, Cl. 366-134.000.

Krufka, Frank S., to RCA Corporation. System and method of accurately controlling the electrode voltage of a welding device. 4,464,556, Cl. 219-113.000.

Kruger, Max; and Moser, Manfred, to Kusters, Eduard. Apparatus for applying foam. 4,463,583, Cl. 68-205.00R.

Krupp Polysius AG: *See*—
Heinemann, Otto; Baldus, Heinz-Dieter; and Schmits, Heinz-Herbert, 4,464,112, Cl. 432-106.000.

Krutsch, John R.: *See*—
Barlow, Gordon A.; Krutsch, John R.; Smollar, Marvin; and Liedtke, Ronald, 4,463,515, Cl. 446-409.000.

Kubota, Ltd.: *See*—
Miyata, Junji; and Matsushita, Yasuhisa, 4,463,623, Cl. 74-473.00R.

Kudlacik, Louis: *See*—
Monhardt, Richard J.; Kudlacik, Louis; Nikkanen, John P.; and Niiler, Juri, 4,463,552, Cl. 60-226.100.

Kuehfuss, Runwalt, to De La Rue Giori SA. Method and apparatus for the manufacture of freshly printed, numbered security papers cut to format. 4,463,677, Cl. 101-426.000.

Kuga, Fumiharu: *See*—
Hachisuka, Hiroshi; and Kuga, Fumiharu, 4,463,820, Cl. 180-143.000.

Kuhl Bauelemente GmbH: *See*—
Schlosser, Helmut, 4,463,527, Cl. 52-103.000.

Kuhn, Franz; and Lippek, Wilfried, to Dr. -Ing. Rudolf Hell GmbH. Method and circuit arrangement for partial recorrection of color recognition spaces in color recognition. 4,464,677, Cl. 358-75.000.

Kuhn, Gerhard: *See*—
Findeis, Gunter; Fergg, Berthold; Zahn, Wolfgang; and Kuhn, Gerhard, 4,464,045, Cl. 355-38.000.

Kuhnert, Gottfried: *See*—
Schimko, Reinhold; Lutz, Albert; and Kuhnert, Gottfried, 4,463,578, Cl. 66-75.100.
Schimko, Reinhold; and Kuhnert, Gottfried, 4,463,579, Cl. 66-75.100.

Kukes, Semyon G.; Harris, Jesse R.; and Banks, Robert L., to Phillips Petroleum Company. Removal of contaminants from organic compositions. 4,464,251, Cl. 208-221.000.

Kumano, Shinji: *See*—
Kondo, Masao; and Kumano, Shinji, 4,464,325, Cl. 264-229.000.

Kumar, Prabhat; Rivers, Ronald D.; and Hickl, Anthony J., to Cabot Corporation. Wrought P/M processing for master alloy powder. 4,464,205, Cl. 148-11.50P.

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Kumasaka, Sadao; and Tada, Satomi, to Oyo Rubber Chemical Industry Co., Ltd. Ball. 4,463,951, Cl. 273-58.00A.

Kumbier, Richard L.: *See*—
Brissette, Ronald N.; and Kumbier, Richard L., 4,463,993, Cl. 308-184.00R.

Kummer, Oskar: *See*—
Bubik, Alfred; Kummer, Oskar; and Rosenberg, Burkard, 4,464,225, Cl. 162-181.600.

Kunicki, Wojciech: *See*—
Milewski, Witold; Brennek, Jerzy; Stanikowski, Lech; Kunicki, Wojciech; Sapiezynski, Wieslaw; Konopczynski, Andrzej; and Kondratowicz, Zbigniew, 4,464,414, Cl. 427-37.000.

Kurakake, Mitsuo, to Fanuc Ltd. Numerical control unit. 4,464,614, Cl. 318-571.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Takita, Hitoshi; Mukaida, Yutaka; Noda, Sakuo; and Kobayashi, Hidetoshi, 4,464,396, Cl. 424-319.000.

Kuri Chemical Engineers Incorporated: *See*—
Kuri, Setuya, 4,464,253, Cl. 210-112.000.

Kuri, Setuya, to Kuri Chemical Engineers Incorporated. Continuous filter. 4,464,253, Cl. 210-112.000.

Kuroki, Takashi: *See*—
Taguchi, Noriyuki; Fuzita, Tsuyoshi; Toda, Gyozo; Ishihara, Syoosaku; Kuroki, Takashi; and Suzuki, Tatsuhiro, 4,464,420, Cl. 427-96.000.

Kuschmierz, Heinz: *See*—
Laufer, Helmut; and Kuschmierz, Heinz, 4,463,725, Cl. 123-446.000.

Kusters, Eduard: *See*—
Gruber, Heinz; Kutz, Johannes; and Moser, Manfred, 4,463,467, Cl. 8-151.000.
Kruger, Max; and Moser, Manfred, 4,463,583, Cl. 68-205.00R.

Kutuzov, Boris N.: *See*—
Vildgrube, Georgy S.; Kutuzov, Boris N.; Sokolsky, Valery N.; Missulovin, Leon Y.; and Kotov, Boris A., 4,464,119, Cl. 434-185.000.

Kutz, Johannes: *See*—
Gruber, Heinz; Kutz, Johannes; and Moser, Manfred, 4,463,467, Cl. 8-151.000.

Kuwabara, Hideki: *See*—
Yoshimura, Shohei; and Kuwabara, Hideki, 4,464,484, Cl. 521-58.000.

Kuwajima, Takeshi: *See*—
Yoshimi, Akiro; Kuwajima, Takeshi; Ootsuka, Fumio; and Matsushima, Takeo, 4,463,801, Cl. 165-43.000.

Kuzmin, Gennady G.: *See*—
Korshunov, Evgeny A.; Kuznetsov, Alexandr N.; Ovodenko, Maxim B.; Kuzmin, Gennady G.; Kostrov, Valery P.; Timofeev, Alexandr N.; Bastrikov, Valery L.; and Meschaninova, Tatyana V., 4,463,796, Cl. 164-460.000.

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Korshunov, Evgeny A.; Kuznetsov, Alexandr N.; Ovodenko, Maxim B.; Kuzmin, Gennady G.; Kostrov, Valery P.; Timofeev, Alexandr N.; Bastrikov, Valery L.; and Meschaninova, Tatyana V., 4,463,796, Cl. 164-460.000.

Kyburz, Emilio: *See*—
Borer, Rene; Gerecke, Max; and Kyburz, Emilio, 4,464,300, Cl. 260-245.500.

Kynast, Lutz T. Heel strap retractor for wheel chair foot rests. 4,463,985, Cl. 297-433.000.

L. & C. Steinmuller GmbH: *See*—
Premel, Ulrich, 4,463,686, Cl. 110-165.00R.

L & L Products, Inc.: *See*—
Coburn, John A., Jr.; and Shaw, Paul R., 4,463,870, Cl. 220-307.000.

La-Man Corporation: *See*—
Mann, David O., 4,464,186, Cl. 55-387.000.

Labeeuw, Bernard; and Salhi, Ali, to Sanofi. Cephalosporin derivatives, process for preparation thereof and drugs containing said derivatives usable as antibiotics. 4,464,367, Cl. 424-246.000.

LaBianca, Michael H.; and Smith, Thomas G., to Tarkett AB. Method for forming dual gloss coating. 4,464,423, Cl. 427-244.000.

Labourdete, Jean-Louis: *See*—
Tranin, Jean-Piere; and Labourdete, Jean-Louis, 4,463,681, Cl. 102-424.000.

Lackner, Anna M.; Margerum, John D.; and Miller, Leroy J., to Hughes Aircraft Company. Process for inducing perpendicular alignment of liquid crystals. 4,464,134, Cl. 445-24.000.

Ladson, Jack A.: *See*—
Karras, Philip; and Ladson, Jack A., 4,464,054, Cl. 356-406.000.

Lagendijk, Johannes. Stiff girder constructed with flexible cable ropes. 4,463,526, Cl. 52-83.000.

L'Aimee Laboratoires, Ltd.: *See*—
Greenhut, Bart E., 4,463,462, Cl. 4-605.000.

Lalezari, Farzin; and Munson, Robert E., to Ball Corporation. Dual polarized, high efficiency microstrip antenna. 4,464,663, Cl. 343-700.0MS.

Lambert, Paul: *See*—
Artaud, Robert; Aubert, Michel; Lemercier, Guy; Lambert, Paul; and Chevallier, Gilbert, 4,464,334, Cl. 376-298.000.

Lane Company, Inc., The: *See*—
Bost, Gretchen L.; and Powell, Hampton O., 4,463,464, Cl. 5-459.000.

Lang Apparatebau GmbH: *See*—
Saalmann, Gunter; and Haslberger, Richard, 4,463,582, Cl. 68-17.00R.

Lang, Gerard: *See*—
Shroot, Braham; Maignan, Jean; and Lang, Gerard, 4,464,301, Cl. 260-351.000.

Langdon, Christopher, to University of Rhode Island. Method of measuring oxygen using a membrane covered polarographic electrode. 4,464,230, Cl. 204-1.00T.

Langston, Jimmy B.: *See*—
Wong, Patrick S.; Langston, Jimmy B.; and Leeper, Harold M., 4,464,258, Cl. 210-205.000.

Lapson, William F.; and Atkinson, William D., to Apple Computer, Inc. Cursor control device for use with display systems. 4,464,652, Cl. 340-710.000.

Larsson, Sven B.: *See*—
Andersson, Bengt U. I.; and Larsson, Sven B., 4,464,008, Cl. 339-226.000.

Laska, Eugene M.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,464,376, Cl. 424-253.000.

Laub, Leonard: *See*—
Reilly, Charles; Laub, Leonard; and Swaminathan, Krishna, 4,464,567, Cl. 250-204.000.

Lauer, William: *See*—
McGaughey, John; McVay, W. Patrick; and Lauer, William, 4,464,177, Cl. 604-168.000.

Laufer, Helmut; and Kuschmierz, Heinz, to Robert Bosch GmbH. Fuel injection device for internal combustion engines, in particular a pump/nozzle for diesel engines. 4,463,725, Cl. 123-446.000.

Laughman, Lanny M.: *See*—
Chenausky, Peter P.; Mongeon, Robert J.; and Laughman, Lanny M., 4,464,758, Cl. 372-11.000.

Laurent, Henry: *See*—
Bittler, Dieter; Laurent, Henry; Weichert, Rudolf; Casals-Stenzel, Jorge; and Schillinger, Ekkehard, 4,464,364, Cl. 424-241.000.
Hofmeister, Helmut; Petzoldt, Karl; Annen, Klaus; Laurent, Henry; Wiechert, Rudolf; and Nishino, Yukeshige, 4,464,365, Cl. 424-243.000.

Lauzanne-Morelle, Eliane M. T.: *See*—
Morelle, Jean V.; and Lauzanne-Morelle, Eliane M. T., 4,464,397, Cl. 424-319.000.

Lawrence, Stephen G.; and Middleton, Brian H., to International Business Machines Corporation. Text processing apparatus with editing of stored document at each keystroke. 4,464,730, Cl. 364-900.000.

Laws, William R.; and Reed, Geoffrey R. Heat shield arrangement for a rolling mill. 4,463,585, Cl. 72-10.000.

Lawson, Floyd A. Trailer mounted boat retainer device. 4,463,965, Cl. 280-414.100.

Lawson, Randy J.: *See*—
Windawi, Hassan; and Lawson, Randy J., 4,464,480, Cl. 502-207.000.

Layden, George K.; and Prewo, Karl M., to United Technologies Corporation. Molding process for fiber reinforced glass matrix composite articles. 4,464,192, Cl. 65-18.100.

Lazik, Paul: *See*—
Ritter, Gunter; Lenz, Uwe; and Lazik, Paul, 4,464,479, Cl. 502-185.000.

Lazzari, Mario; and Scrosati, Bruno, to Consiglio Nazionale Delle Ricerche. Rechargeable lithium batteries with non-metal electrodes. 4,464,447, Cl. 429-194.000.

Le-Jo Enterprises, Inc.: *See*—
Giangiulio, Clayton; and D'Ambro, Dominic, 4,464,109, Cl. 431-344.000.

Le Berre, Serge; Hareng, Michel; Beguin, Annie; and Thirant, Lydie, to Thomson-CSF. Smectic liquid crystal display device without a nematic phase. 4,464,020, Cl. 350-350.00S.

Leckband, Uwe; Thiele, Willi; Hagenah, Klaus; and Forster, Hans, to Hauni-Werke Korber & Co. KG. Method and apparatus for storing and transporting comminuted tobacco or the like. 4,463,769, Cl. 131-109.0AB.

Le Coent, Jean-Louis; and Demoures, Bernard, to Orogil. Super-alkalinized detergent-dispersant additives for lubricating oils and method of making same. 4,464,289, Cl. 252-33.400.

Lee, David G.: *See*—
Nichols, James H., Jr.; Furey, Roger J.; Englar, Robert J.; and Lee, David G., 4,463,920, Cl. 244-207.000.

Lee, John R.; and Buckner, Stephen W. Fuel system heating apparatus for diesel engines. 4,463,738, Cl. 123-552.000.

Lee-Norse Company: *See*—
Westphal, Mark A., 4,463,973, Cl. 285-298.000.

Lee, Richard C., to Hardinge Brothers, Inc. Parts catcher for an automatic machine. 4,463,634, Cl. 82-34.00R.

Lee, Shih-Ying, to Setra Systems, Inc. Force transducer. 4,463,614, Cl. 73-862.640.

Leeper, Harold M.: *See*—
Wong, Patrick S.; Langston, Jimmy B.; and Leeper, Harold M., 4,464,258, Cl. 210-205.000.

Leesona Corporation: *See*—
Whiteside, Robert C.; and Greynolds, Fred L., 4,464,329, Cl. 264-544.000.

Lefebvre, Henri: *See*—
Vancheri, Patrice; and Lefebvre, Henri, 4,464,129, Cl. 441-16.000.

Leffler, Hakon; and Svanborg Eden, Catharina. Glycosphingalipids for inhibiting bacterial adherence. 4,464,360, Cl. 424-180.000.

Leiber, Heinz, to Robert Bosch GmbH. Braking-force booster. 4,463,561, Cl. 60-547.100.

Leibhard, Erich, to Hilti Aktiengesellschaft. Expansion dowel assembly. 4,464,076, Cl. 403-297.000.

Leiserson, Steven G. Video equipment bag. 4,463,789, Cl. 150-52.00J.

Lemercier, Guy: *See*—
Artaud, Robert; Aubert, Michel; Lemercier, Guy; Lambert, Paul; and Chevallier, Gilbert, 4,464,334, Cl. 376-298.000.

Lempel, Abraham: *See*—
Eastman, Willard L.; Lempel, Abraham; Ziv, Jacob; and Cohn, Martin, 4,464,650, Cl. 340-347.0DD.

Lenertz, John L., to Yukon Energy Corporation. Electric log splitter. 4,463,787, Cl. 144-193.00R.

Lengyel, Stephen P. Mixed ethoxylated alcohol/ethoxy sulfate surfactants and synthetic detergents incorporating the same. 4,464,292, Cl. 252-532.000.

Lennox, John C., Jr.; McAllister, Warren A.; and Mason, Donald L., to Burroughs Wellcome Co. Dissolution flask. 4,464,340, Cl. 422-103.000.

Lenz, Uwe: *See*—
Ritter, Gunter; Lenz, Uwe; and Lazik, Paul, 4,464,479, Cl. 502-185.000.

Leonard, Emil T., to J.I. Case Company. Vibratory plow assembly. 4,463,509, Cl. 37-193.000.

Leonard, Eric M.; and Knight, William W., to Eastman Kodak Company. Optical disk mounting means for write/read apparatus. 4,464,670, Cl. 346-137.000.

Lerwill, William E., to Bird, James M. Method and apparatus for generation of acoustic energy. 4,463,825, Cl. 181-113.000.

Leshik, Richard R.; Iyer, Bala S.; and Carpenter, John R., to General Foods Corporation. Instant pudding composition containing cocoa and process. 4,464,403, Cl. 426-271.000.

L'Etat Francais: *See*—
Besson, Raymond J. C.; and Maitre, Pierre C., 4,464,598, Cl. 310-344.000.

Levenspiel, Octave: *See*—
Fitzgerald, Thomas J.; and Levenspiel, Octave, 4,463,502, Cl. 34-1.000.

Lever Brothers Company: *See*—
Cox, Roger B.; and Steer, David C., 4,464,410, Cl. 426-573.000.
de Rooij, Johannes F. M., 4,464,409, Cl. 426-536.000.
Parslow, Michael W.; and Willis, Edwin, 4,464,272, Cl. 252-8.800.
Parslow, Michael W.; and Willis, Edwin, 4,464,273, Cl. 252-8.800.
Rapisarda, Anthony; Camps, Edilia; and Bauer, Herbert, 4,464,281, Cl. 252-174.210.

Levolor Lorentzen, Inc.: *See*—
Anderle, Joseph A.; and Dodich, James, 4,463,536, Cl. 52-488.000.

Lewis, Bernard L.; and Kretschmer, Frank F., Jr., to United States of America, Navy. Adaptive preprocessing system. 4,464,768, Cl. 375-101.000.

Lewis, Duane H., to Continental Plastics, Inc. Tamper-evident spice can lid. 4,463,869, Cl. 220-307.000.

Lewmar Marine Limited: *See*—
Shuker, Brian, 4,463,932, Cl. 254-266.000.

Lewtas, Kenneth: *See*—
Tack, Robert D.; Lewtas, Kenneth; and Brazier, John R., 4,464,182, Cl. 44-62.000.

Lexel Corporation: *See*—
Mohler, Galen E., 4,464,763, Cl. 372-107.000.

Leyck, Sigurd: *See*—
Betzing, Hans; and Leyck, Sigurd, 4,464,379, Cl. 424-263.000.

LGZ Landis & Gyr Zug AG.: *See*—
Lienhard, Heinz; Petr, Jan; and Steinle, Benedikt, 4,464,625, Cl. 324-117.00R.

Lhospice, Bernard, to Essilor International Cie Generale d'Optique. Spectacle frame. 4,464,025, Cl. 351-106.000.

Liao, Kuo M. Limb-supporting frame which is movable and easy to be dismantled. 4,463,752, Cl. 128-87.00R.

Licari, Vito; and Licari, Yaffa, to Basic Line, Inc. Rack for footwear. 4,463,853, Cl. 211-37.000.

Licari, Yaffa: *See*—
Licari, Vito; and Licari, Yaffa, 4,463,853, Cl. 211-37.000.

Licentia Patent-Verwaltungs-GmbH: *See*—
Kluth, Hans-Jurgen, 4,464,684, Cl. 358-310.000.
Maurer, Robert; and Frank, Georg, 4,464,770, Cl. 375-119.000.
Pikorz, Wolfgang; Scheuermann, Hans; and Sonntag, Alois, 4,464,441, Cl. 428-579.000.

Lichtenstein, Eric S. Computer-control medical care system. 4,464,172, Cl. 604-65.000.

Liedtke, Ronald: *See*—
Barlow, Gordon A.; Krutsch, John R.; Smollar, Marvin; and Liedtke, Ronald, 4,463,515, Cl. 446-409.000.

Lienhard, Heinz; Petr, Jan; and Steinle, Benedikt, to LGZ Landis & Gyr Zug AG. Magnetoresistive current detector. 4,464,625, Cl. 324-117.00R.

Liepins, Raimond, to United States of America, Energy. Method of forming metallic coatings on polymeric substrates. 4,464,416, Cl. 427-40.000.

Lierl, Theodore J. Magnetic toy cart. 4,464,125, Cl. 434-330.000.

Lindahl, Richard W., to Minnesota Mining and Manufacturing Company. Electrographic recording apparatus. 4,464,672, Cl. 346-153.100.

Lindauer, Jerome I.: *See*—
Munteanu, Marina A.; Cseko, Christine; Oltarzewski, Edward S.; Lindauer, Jerome I.; and Withycombe, Donald A., 4,464,271, Cl. 252-8.600.

Linde Aktiengesellschaft: *See*—
Rampf, Herbert, 4,463,500, Cl. 33-129.000.

Lindemann, Eckhart. System and apparatus for plant tissue culture propagation. 4,463,522, Cl. 47-58.000.

Lindenthal, Hans, to Voith Transmit GmbH. Telescopic shaft. 4,464,139, Cl. 464-69.000.

Lindow, Steven E.: *See*—
Orser, Cindy S.; Lindow, Steven E.; Panopoulos, Nickolas J.; and Staskawicz, Brian J., 4,464,473, Cl. 435-172.300.

Lineback, Donald R., to Linecat Industries, Inc. Sailing craft. 4,463,699, Cl. 114-39.000.

Linecat Industries, Inc.: *See*—
Lineback, Donald R., 4,463,699, Cl. 114-39.000.

Linek, Francis W.: *See*—
Thies, Curt; and Linek, Francis W., 4,464,317, Cl. 264-4.300.

Linhardt, Hans D. Gas to liquid mass transfer device and method. 4,464,309, Cl. 261-23.00R.

Linn, Karl-Otto: *See—*
Burger, Kurt; Friedrich, Heinz; Gruner, Heiko; Linn, Karl-Otto; and Zabler, Erich, 4,464,646, Cl. 338-25.000.

Lippek, Wilfried: *See—*
Kuhn, Franz; and Lippek, Wilfried, 4,464,677, Cl. 358-75.000.

Lisowski, Robert M.: *See—*
Crowley, Albert T.; and Lisowski, Robert M., 4,464,638, Cl. 331-1.00A.

Little, Paul V., to Dover Findings Inc. Process for fabricating miniature hollow gold spheres. 4,464,231, Cl. 204-9.000.

Little, Richard E.: *See—*
Kline, Samuel J.; and Little, Richard E., 4,464,543, Cl. 179-8.00R.

Liu, Ping Y.; and Miller, Kenneth F., to General Electric Company. Composition comprising an aromatic polyester-carbonate resin and a linear low density polyolefin polymer. 4,464,512, Cl. 525-146.000.

Livermore, David G. H.: *See—*
O'Callaghan, Cynthia H.; Ayres, Barry E.; Newall, Christopher E.; Livermore, David G. H.; and Sutherland, Derek R., 4,464,368, Cl. 424-246.000.

Ljungcrantz, Billy, to Tetra Pak Developpement SA. Method of making reclosable pour opening structure for a packaging container. 4,464,154, Cl. 493-87.000.

Logan, Ralph A.; and Tsang, Won-Tien, to AT&T Bell Laboratories. Method for selective area growth by liquid phase epitaxy. 4,464,211, Cl. 148-171.000.

Long, John D.; and Stevens, Phillip E., to Deere & Company. Spring mounted standard assembly. 4,463,813, Cl. 172-705.000.

L'Oreal: *See—*
Gueret, Jean-Louis H., 4,463,485, Cl. 128-62.00R.

Lostrom, Mark E., to Genetic Systems Corporation. Cell-driven viral transfer in eukaryotes. 4,464,465, Cl. 435-68.000.

Lougheed, Robert M.: *See—*
Sternberg, Stanley R.; Lougheed, Robert M.; and Dargel, William O., 4,464,788, Cl. 382-41.000.

Loutfy, Raouf O.: *See—*
Minh, Nguyen Q.; Loutfy, Raouf O.; and Yao, Neng-Ping, 4,464,234, Cl. 204-67.000.

Lovey, Raymond G.: *See—*
Bristol, James A.; and Lovey, Raymond G., 4,464,372, Cl. 424-250.000.

Lowe, Gerald A.: *See—*
Kerr, Douglas S.; and Lowe, Gerald A., 4,463,517, Cl. 446-421.000.

LTV Aerospace and Defense Company, The: *See—*
Redmond, William G., 4,464,661, Cl. 340-960.000.

Lu, Pang-Chia, to Mobil Oil Corporation. Blends of polyvinyl alcohol and ethylene-vinyl alcohol copolymer as grease resistant melt extrudable films. 4,464,438, Cl. 428-516.000.

Luca, Vincent A., Jr.: *See—*
Werth, Dee A.; and Luca, Vincent A., Jr., 4,464,000, Cl. 339-89.00M.

Lucas Industries Limited: *See—*
Harrison, Anthony W., 4,463,969, Cl. 280-707.000.

Lucas Industries Public Limited Company: *See—*
Mowbray, Dorian F., 4,464,099, Cl. 417-510.000.
Taft, Phillip A., 4,463,562, Cl. 60-555.000.

Luce, David A., to Clark, Melville, Jr. Musical instrument. 4,463,647, Cl. 84-1.010.

Luciani, Pierre: *See—*
Boisseuil, Lucien; Luciani, Pierre; and Merard, Rene , 4,464,332, Cl. 376-215.000.

Lucien Ferraz & Cie: *See—*
Chambon, Michel, 4,464,623, Cl. 324-72.500.

Ludwig, Richard H.; Dirnberger, Linus R.; and Husson, Alan L., to Westinghouse Electric Corp. Elevator system. 4,463,833, Cl. 187-29.00R.

Lukos, Simon F. Apparatus for insulating a surface area. 4,463,792, Cl. 160-271.000.

Lumsuss Industries, Inc.: *See—*
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Hudson, Wilbur G.; Webb, Tommy W.; Phillips, William S.; Tompa, Thomas J.; and Sanders, Edward, Jr., 4,463,669, Cl. 100-43.000.

Lundgren, Bengt, to SKF Mekanprodukter AB. Torque transmitting coupling. 4,464,140, Cl. 464-71.000.

Lutz, Albert: *See—*
Schimko, Reinhold; Lutz, Albert; and Kuhnert, Gottfried, 4,463,578, Cl. 66-75.100.

Lutz, George A.: *See—*
Zeno, Robert V.; Lutz, George A.; and Amin, Jayendra J., 4,463,573, Cl. 62-157.000.

Lutz, Walter: *See—*
Bosse, Dieter; Wingen, Rainer; Horn, Klaus; and Lutz, Walter, 4,464,457, Cl. 430-288.000.

Lybolt, Arden F. Building block handling tool. 4,463,979, Cl. 294-62.000.

Lynch, Joseph M.; Pfafflin, James R.; Pecker, Calman; Cardenas, Raul; Cunningham, Seamus; Bozzone, Richard T., Sr.; and Borg, Sidney, to Process Research Development & Management, Inc. Apparatus for the treatment of wastewater sludge. 4,464,257, Cl. 210-195.100.

Lytle, William F. Universal slip-on mounting for disposable chart pens. 4,464,671, Cl. 346-140.00A.

MacFarlane, John L., to AutoWeigh Co. Load cell assembly for conveyor weighing of bulk material. 4,463,816, Cl. 177-119.000.

Machida, Bon: *See—*
Tsubone, Masahiro; and Machida, Bon, 4,463,861, Cl. 215-12.00R.

Machida, Kaoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Radiography apparatus. 4,464,777, Cl. 378-146.000.

Machida, Shigeru; Tojo, Kenji; Ikegawa, Masato; and Shiibayashi, Masao, to Hitachi, Ltd. Scroll fluid apparatus handling compressible fluid. 4,464,100, Cl. 418-55.000.

Machinefabriek Geurtsen Deventer B.V.: *See—*
Geurtsen, Alfonsus A., 4,463,830, Cl. 182-238.000.

Macirowski, Thomas: *See—*
Tepic, Slobodan, 4,463,875, Cl. 222-82.000.

MacKenzie, David D. Book support assembly. 4,463,854, Cl. 211-43.000.

Macklin, Gary T.: *See—*
Wright, Randall J.; and Macklin, Gary T., 4,463,501, Cl. 33-350.000.

Madhav, Jagdish T.: *See—*
Jacobs, Norman A.; and Madhav, Jagdish T., 4,464,681, Cl. 358-285.000.

Maeda, Kunio: *See—*
Hattori, Yoshihiro; Watanabe, Takashi; and Maeda, Kunio, 4,464,435, Cl. 428-409.000.

Maeguchi, Kenji, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of forming a semiconductor device on insulating substrate by selective amorphosization followed by simultaneous activation and reconversion to single crystal state. 4,463,492, Cl. 29-576.00B.

Maher, Robert J.; and Tooson, Ronald, to Douthitt Corporation. Overhead multiple lamp mount console for a vacuum printer. 4,464,047, Cl. 355-93.000.

Maignan, Jean: *See—*
Shroot, Braham; Maignan, Jean; and Lang, Gerard, 4,464,301, Cl. 260-351.000.

Mailand, John J.; and Huber, Charles D., to Minnesota Mining and Manufacturing Company. Weatherstrip assembly for entry door. 4,463,523, Cl. 49-478.000.

Maisonneuve, Leo. Finboard exercising apparatus. 4,464,126, Cl. 440-15.000.

Maitre, Pierre C.: *See—*
Besson, Raymond J. C.; and Maitre, Pierre C., 4,464,598, Cl. 310-344.000.

Majima, Teiji; and Ozaki, Kiyoshi, to Fujitsu Limited. Method of forming a pattern of metal elements. 4,464,459, Cl. 430-313.000.

Major, Emery. Prime mover. 4,464,592, Cl. 310-54.000.

Makino, Tetsuya; Itazawa, Masakatsu; and Ogura, Kenzi, to Ryo-Nichi Co., Ltd. Process for the suspension polymerization of vinyl chloride. 4,464,517, Cl. 526-88.000.

Malarz, Antoni J.: *See—*
Dais, William F.; and Malarz, Antoni J., 4,463,881, Cl. 222-375.000.

Mallinckrodt, Inc.: *See—*
Wijayarathna, Bandula, 4,464,176, Cl. 604-164.000.

Malone, Emerson G.: *See—*
Church, John G.; and Malone, Emerson G., 4,464,560, Cl. 219-137.420.

Malott, Richard C., to General Motors Corporation. Shield for labyrinth seal. 4,463,956, Cl. 277-12.000.

Mandel, George. Contamination protection member for opening and resealing device. 4,463,866, Cl. 220-269.000.

Mango, Phillip A., to Air Products and Chemicals, Inc. Vinyl chloride-propylene copolymers having increased porosity. 4,464,519, Cl. 526-200.000.

Mann, David O., to La-Man Corporation. Pneumatic filter and liquid evaporator. 4,464,186, Cl. 55-387.000.

Mann, Robert W.: *See—*
Tepic, Slobodan, 4,463,875, Cl. 222-82.000.

Mannesmann Rexroth GmbH: *See—*
Dantlgraber, Joerg; and Mueller, Albert, 4,463,929, Cl. 251-44.000.
Mucheyer, Norbert; and Schulte, Heinz, 4,463,660, Cl. 91-469.000.

Mannion, Geoffrey; and Palmer, Patrick V., to International Mechanite Metal Company Limited, The. Apparatus and process for the treatment of molten metal. 4,464,198, Cl. 75-130.00R.

Manseau, Daniel A.: *See—*
Marentic, Michael J.; and Manseau, Daniel A., 4,464,657, Cl. 340-776.000.

Marathon Manufacturing Company: *See—*
McClure, David K., 4,463,791, Cl. 160-178.00C.

Marathon Oil Company: *See—*
Schroeder, Donald E., Jr., 4,464,509, Cl. 525-53.000.

March, Roger W.: *See—*
Buckley, Edward M.; Druke, Michael B.; and March, Roger W., 4,464,772, Cl. 377-47.000.

Marcon Electronics Co. Ltd.: *See—*
Yokomizo, Yuji; Yuuki, Keiji; and Watanabe, Naoe, 4,464,647, Cl. 338-35.000.

Maremont Corporation: *See—*
Ergun, Joseph, 4,463,974, Cl. 285-323.000.

Marentic, Michael J.; and Manseau, Daniel A., to Interstate Electronics Corp. Modular waveform generator for plasma display panels. 4,464,657, Cl. 340-776.000.

Margerum, John D.: *See—*
Lackner, Anna M.; Margerum, John D.; and Miller, Leroy J., 4,464,134, Cl. 445-24.000.

Marker-Patentverwertungsgesellschaft mbH: *See—*
Klubitschko, Gerd, 4,463,967, Cl. 280-605.000.

Martin, Christoph: *See—*
Gramlich, Walter; Himmele, Walter; Martin, Christoph; Pommer, Ernst-Heinrich; and Siegel, Hardo, 4,464,370, Cl. 424-248.400.

Martin, Eugene J.: *See—*
Tootle, James N.; and Martin, Eugene J., 4,463,657, Cl. 91-44.000.

Martin, Francis W.: *See*—
Beall, George H.; Chirino, Agustin M.; Chyung, Kenneth; Martin, Francis W.; and Taylor, Mark P., 4,464,475, Cl. 501-9.000.

Martin, Savy. Driving mechanism for bicycle and the like devices. 4,463,963, Cl. 280-253.000.

Martineau, Yves, to Societes Anonymes: Automobiles Citroen et Automobiles Peugeot. Carburettor. 4,464,313, Cl. 261-78.00R.

Marvin Glass & Associates: *See*—
Smathers, Robert E.; Wildman, John R.; and Meyer, Burton C., 4,463,518, Cl. 446-237.000.

Mascioli, Rocco L.: *See*—
Bechara, Ibrahim S.; and Mascioli, Rocco L., 4,464,490, Cl. 521-128.000.

Mase, Toshiyasu: *See*—
Murase, Kiyoshi; Mase, Toshiyasu; Arima, Hideki; Niigata, Kunihiro; Tomioka, Kenichi; and Kobayashi, Shinichiro, 4,464,384, Cl. 424-270.000.

Mashimo, Yukio: *See*—
Iwashita, Tomonori; and Mashimo, Yukio, 4,464,031, Cl. 354-173.100.
Nakamura, Zenzo; Uchiyama, Takashi; Ohtaki, Shohei; Tsunekawa, Tokuichi; Uchidoi, Masanori; and Mashimo, Yukio, 4,464,609, Cl. 315-241.00P.

Mason, Carl E.; and Geffen, Samuel E., to NL Industries, Inc. Method for effecting seals in earth boreholes. 4,463,808, Cl. 166-292.000.

Mason, Donald L.: *See*—
Lennox, John C., Jr.; McAllister, Warren A.; and Mason, Donald L., 4,464,340, Cl. 422-103.000.

Massachusetts Institute of Technology: *See*—
Chiang, Alice M., 4,464,726, Cl. 364-606.000.
Haus, Hermann A.; Glasser, Lance A.; and Ho, Ping-Tong, 4,464,759, Cl. 372-18.000.

Masubuchi, Masami, to Osaka University. Wave energy converter. 4,464,578, Cl. 290-42.000.

Masuda, Jiro: *See*—
Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, 4,463,822, Cl. 180-177.000.

Masuda, Tsunehara: *See*—
Asari, Akira; Noyori, Tatsuhiko; Tabuchi, Takahisa; Masuda, Tsunehara; and Mizoguchi, Masao, 4,463,589, Cl. 72-273.500.

Masui, Michio; Ogawa, Yasuhiro; and Esumi, Kunio, to Tokyo Shibaura Denki Kabushiki Kaisha. Secondary arc extinction device. 4,464,696, Cl. 361-42.000.

Masumoto, Takashi: *See*—
Taniguthi, Tatsuhito; Niwa, Yutaka; and Masumoto, Takashi, 4,463,777, Cl. 137-553.000.

Masur, Christian, to Autophon A.G. Radio transmission system for binary coded signals. 4,464,766, Cl. 375-49.000.

Mataki, Hiroshi: *See*—
Fujikawa, Junichi; Mataki, Hiroshi; Tanaka, Chiaki; and Nakashima, Shinobu, 4,464,456, Cl. 430-281.000.

Matejec, Reinhart; Nittel, Fritz; and Sobel, Johannes, to Agfa-Gevaert Aktiengesellschaft. Color photographic recording material. 4,464,464, Cl. 430-546.000.

Matheson, Frederick A.: *See*—
Gurr, George P.; and Matheson, Frederick A., 4,464,724, Cl. 364-492.000.

Matolcsy, Geza A., to CIP Inc. Process for manufacture of high bulk paper. 4,464,224, Cl. 162-111.000.

Matsuda, Yoshio, to Yoshida Kogyo K. K. Method of manufacturing a velvet-type fastener web. 4,463,486, Cl. 28-161.000.

Matsui, Kunihiko: *See*—
Tanaka, Shikei; and Matsui, Kunihiko, 4,464,629, Cl. 330-6.000.

Matsumoto, Akio; Morishita, Mitsuharu; Yokota, Mitsuyoshi; and Kouge, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Vehicular generator with cooling fan made of rubber covered shape memorizing alloy. 4,464,594, Cl. 310-63.000.

Matsumura, Koichi; and Aono, Tetsuya, to Takeda Chemical Industries, Ltd. Process for production of sugar ketals. 4,464,530, Cl. 536-124.000.

Matsuo, Kenji: *See*—
Suzuki, Yasoji; and Matsuo, Kenji, 4,464,587, Cl. 307-279.000.

Matsuoka, Hiroki, to Toyota Jidosha Kabushiki Kaisha. Device and method for controlling fuel injected internal combustion engine providing cold acceleration extra fuel. 4,463,731, Cl. 123-492.000.

Matsushima, Takeo: *See*—
Yoshimi, Akiro; Kuwajima, Takeshi; Ootsuka, Fumio; and Matsushima, Takeo, 4,463,801, Cl. 165-43.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Nakada, Seiichi; Yoshikawa, Hiromi; Ohno, Hiroshi; Nishijima, Tsuneo; and Kawakami, Hiroshi, 4,463,473, Cl. 15-339.000.
Setsune, Kentaro, 4,464,597, Cl. 310-313.00B.
Shinozaki, Nozomu; Dohi, Takashi; and Neki, Shigeo, 4,463,698, Cl. 112-275.000.

Matsushita, Yasuhisa: *See*—
Miyata, Junji; and Matsushita, Yasuhisa, 4,463,623, Cl. 74-473.00R.

Matsuyama, Kouzou, to Tokyo Shibaura Denki Kabushiki Kaisha. Image forming apparatus. 4,464,044, Cl. 355-14.00R.

Matthews, Patricia C.: *See*—
Walker, Thad O.; and Matthews, Patricia C., 4,464,269, Cl. 252-8.55R.

Matti, David M. Battery pack cartridge. 4,464,445, Cl. 429-99.000.

Mattsson, Per-Arne, to Verktygsindustrie I Blidsberg AB. Pneumatic motor drive. 4,463,656, Cl. 91-20.000.

Mauck, Lee E. Life preserver. 4,464,132, Cl. 441-81.000.

Maupas, Philippe C.: *See*—
Coursaget, Pierre L. J.; and Maupas, Philippe C., 4,464,474, Cl. 436-513.000.

Maurer, Robert; and Frank, Georg, to Licentia Patent-Verwaltungs-GmbH. Synchronous radio or television receiver with analog high frequency section followed by digital low frequency section. 4,464,770, Cl. 375-119.000.

Maxian, Joseph: *See*—
Maxian, Paul; and Maxian, Joseph, 4,463,508, Cl. 37-142.500.

Maxian, Paul; and Maxian, Joseph. Backfill compactor. 4,463,508, Cl. 37-142.500.

May and Co., Inc.: *See*—
May, George C.; May, Robert G.; and May, Lawrence T., 4,463,466, Cl. 5-475.000.

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May, Robert G.: *See*—
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Mayberry, Mickey L.: *See*—
Reavis, Robert P.; Mayberry, Mickey L.; Willette, David; Weisenburger, Lawrence P.; and Bates, Reginald A., 4,463,998, Cl. 339-40.000.

Mayer, Walter: *See*—
Karl, Rupert; and Mayer, Walter, 4,463,548, Cl. 57-263.000.

Mazzarella, Mildred. Toy doll with simulated growing tooth. 4,463,516, Cl. 446-320.000.

McAllister, Warren A.: *See*—
Lennox, John C., Jr.; McAllister, Warren A.; and Mason, Donald L., 4,464,340, Cl. 422-103.000.

McCarthy, Jeremiah P.: *See*—
Goldman, Ernest A.; McCarthy, Jeremiah P.; and Poppert, Paul E., 4,463,491, Cl. 29-571.000.

McClintock, Larry L.: *See*—
Miller, Gordon W.; and McClintock, Larry L., 4,464,702, Cl. 361-328.000.

McClure, David K., to Marathon Manufacturing Company. Venetian blind cord lock for up to eight lift cords. 4,463,791, Cl. 160-178.00C.

McCord, H. Lee, to Garlock, Inc. Band seal clamp. 4,463,975, Cl. 285-419.000.

McCord, James W. Vapor generating and recovery apparatus including a refrigerant system with refrigerant heat removal means. 4,463,575, Cl. 62-184.000.

McCord, Kenneth R.: *See*—
Barger, Larry N., deceased; Barger, William A., administrator; and McCord, Kenneth R., 4,464,179, Cl. 604-250.000.

McCoy, George W., Jr.: *See*—
McCoy, George W., Sr.; and McCoy, George W., Jr., 4,463,949, Cl. 273-1.0GI.

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McCoy, George W., Sr.; and McCoy, George W., Jr., 4,463,949, Cl. 273-1.0GI.

McCreery, William G. Direct connected spinning rod handle. 4,463,512, Cl. 43-22.000.

McCullough, John E., to Arthur D. Little, Inc. Method of fabricating scroll members by coining and tools therefor. 4,463,591, Cl. 72-360.000.

McDonald, Sandy, to Southmedic Incorporated. Safety control and lock for anesthetic vaporizers. 4,463,754, Cl. 128-200.140.

McDonald, Thomas J.; and Follows, Christopher, to IMI Marston Limited. Brazing alloy. 4,464,442, Cl. 428-654.000.

McDowell, Leon H.; Weber, Roger E.; and Schmieder, Daniel J., to Boeing Company, The. Simulator circuit for electrohydraulically controlled aircraft surfaces. 4,463,605, Cl. 73-432.0SD.

McElroy, David J., to Texas Instruments Incorporated. Semiconductor dynamic memory cell array with word lines extending into windows of capacitor plate. 4,464,734, Cl. 365-51.000.

McGaughey, John; McVay, W. Patrick; and Lauer, William, to Critikon, Inc. Differential pressure device for accelerated catheter flashback. 4,464,177, Cl. 604-168.000.

McGraw-Edison Company: *See*—
Ghafourian, Ali A., 4,464,547, Cl. 200-17.00R.
Holmgren, Nils V., 4,464,583, Cl. 307-147.000.

McHugh, Thomas M.: *See*—
Bullis, Robert H.; DiDomenico, Robert A.; Kimberley, John A.; McHugh, Thomas M.; Parent, Christopher A.; Voss, James R.; and Wiegand, Walter J., 4,463,729, Cl. 123-478.000.

McInerney, Charles E., to Garrett Corporation, The. Turbocharger turbine housing assembly. 4,463,564, Cl. 60-602.000.

McKay, Bill E., Jr.: *See*—
Myers, Virginia K.; McKay, Bill E., Jr.; and Busch, Lloyd E., 4,464,250, Cl. 208-120.000.

McKee, Kevin D.: *See*—
Ahlschwede, Brian A.; and McKee, Kevin D., 4,463,628, Cl. 74-861.000.

McKenna, Joseph V., to Singer Company, The. Digitized pickoff system. 4,464,721, Cl. 364-453.000.

McKenzie, Claude F., executor: *See*—
Kagdis, William A., deceased, 4,464,785, Cl. 381-117.000.

McLaren, John W.: *See—*
Stoesser, Paul R.; Cuzic, John E.; and McLaren, John W., 4,463,90-, Cl. 239-329.000.
McLarty, Gerald E. Solid-state heating and cooling apparatus. 4,463,569, Cl. 62-3.000.
McVay, W. Patrick: *See—*
McGaughey, John; McVay, W. Patrick; and Lauer, William, 4,464,177, Cl. 604-168.000.
McVey, Charles I., to General Electric Company. Ceramic seal for high pressure sodium vapor lamps. 4,464,603, Cl. 313-624.000.
McWhorter, Edward M. Engine connecting rod and piston assembly. 4,463,710, Cl. 123-48.00B.
Measurex Corporation: *See—*
Rastogi, Laxmi K.; and Sussman, Scot W., 4,464,111, Cl. 432-24.000.
MecanARBED s.a.r.l.: *See—*
Mercatoris, Robert; Artois, Fernand; Colling, Joseph; and Feitler, Albert, 4,464,055, Cl. 366-26.000.
Mecatherm: *See—*
Voegtlin, Rene, 4,464,105, Cl. 425-364.00R.
Medellec Limited: *See—*
Hulin, David K., 4,464,561, Cl. 219-216.000.
Medero, Richard: *See—*
Glover, Wayne; and Medero, Richard, 4,464,123, Cl. 434-268.000.
Medical Graphics Corporation: *See—*
Anderson, Stephen T.; Anderson, Catherine A.; and Kapsen, Terrance J., 4,463,764, Cl. 128-719.000.
Meenan, William C.; and Sullivan, George D., to American Toxic Disposal Partners. Method and apparatus for treating polychlorinated biphenyl contaminated sludge. 4,463,691, Cl. 110-346.000.
Meershoek, Hans, to U.S. Philips Corporation. Device for displaying television pictures and deflection unit therefor. 4,464,643, Cl. 335-213.000.
Meister, Jack B.; and Van Winkle, David W., to J.B.M. Associates. Method and system for monitoring the dispensing of drugs or nutrients to animals. 4,463,706, Cl. 119-51.00R.
Mellott, Hayes R. Timber dapping apparatus. 4,463,786, Cl. 144-133.00A.
Mennesson, Jean-Francois R., to Institut National da la Sante et de la Recherche Medicale - I.N.S.E.R.M. Active ambulating device, or walker. 4,463,817, Cl. .180-65.500.
Merard, Rene : *See—*
Boisseuil, Lucien; Luciani, Pierre; and Merard, Rene , 4,464,332, Cl. 376-215.000.
Mercatoris, Robert; Artois, Fernand; Colling, Joseph; and Feitler, Albert, to MecanARBED s.a.r.l. Apparatus for the production of colloidal mixtures. 4,464,055, Cl. 366-26.000.
Merck & Co., Inc.: *See—*
Higuchi, Takeru; Nishihata, Toshiaki; and Rytting, Howard J., 4,464,363, Cl. 424-232.000.
Huang, Leeyuan, 4,464,395, Cl. 424-319.000.
Merck Patent GmbH: *See—*
Hasegawa, Shinji; Toriyama, Kazuhisa; Pohl, Ludwig; and Weber, Georg, 4,464,283, Cl. 252-299.630.
Merckel, Gerald U.: *See—*
Dixon, Jerry D.; Farrell, Robert H.; Merckel, Gerald U.; Neely, Jack D.; Schmitt, Stephen A.; Verdoorn, William G., Jr.; and Bandy, Peter B., 4,464,718, Cl. 364-200.000.
Meritex Plastic Inc.: *See—*
Cecil, Waldo E., 4,463,851, Cl. 206-328.000.
Merkel, Heinrich: *See—*
Andres, Johannes; Hasenkamp, Rainer; and Merkel, Heinrich, 4,464,202, Cl. 106-139.000.
Merkle Engineers, Inc.: *See—*
James, Barry R., 4,463,689, Cl. 110-334.000.
Meschaninova, Tatyana V.: *See—*
Korshunov, Evgeny A.; Kuznetsov, Alexandr N.; Ovodenko, Maxim B.; Kuzmin, Gennady G.; Kostrov, Valery P.; Timofeev, Alexandr N.; Bastrikov, Valery L.; and Meschaninova, Tatyana V., 4,463,796, Cl. 164-460.000.
Metex Corporation: *See—*
Usher, Peter P.; and Gavaletz, Eugene J., 4,463,959, Cl. 277-230.000.
Metz, Pierre, to Thomson-Brandt. Gas jet steering device and method missile comprising such a device. 4,463,921, Cl. 244-3.220.
Meyer, Burton C.: *See—*
Smathers, Robert E.; Wildman, John R.; and Meyer, Burton C., 4,463,518, Cl. 446-237.000.
Meyer, Norbert: *See—*
Janssen, Bernd; Meyer, Norbert; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,464,381, Cl. 424-269.000.
Meystre, Noel: *See—*
Miller, Helmut; Baumann, Kurt; Halder, Franz; and Meystre, Noel, 4,464,580, Cl. 290-52.000.
Michaels, Thomas L., to Baxter Travenol Laboratories, Inc. Non-refillable humidifier container. 4,464,316, Cl. 261-121.00R.
Michaud-Soret, Jean A., to Societe Nationale Industrielle Aerospatiale. Semi-finished product based on fibers preimpregnated with polymerizable resin. 4,464,429, Cl. 428-117.000.
Michel, James J.: *See—*
Carsello, Anthony; and Michel, James J., 4,463,544, Cl. 56-17.100.
Middleton, Brian H.: *See—*
Lawrence, Stephen G.; and Middleton, Brian H., 4,464,730, Cl. 364-900.000.
Mikawa, Hiroji, to Hitachi, Ltd. Fuel cell power generation system and method of operating the same. 4,464,444, Cl. 429-13.000.
Mikesell, Jon L.: *See—*
Dotson, Danny W.; Mikesell, Jon L.; and Senftle, Frank E., 4,464,338, Cl. 422-78.000.
Mikhail, Joanne E.: *See—*
Polis, Marjorie J.; and Mikhail, Joanne E., 4,463,834, Cl. 187-29.00R.
Milamed, Robert L.: *See—*
Greenleaf, Allen H.; and Milamed, Robert L., 4,463,560, Cl. 60-527.000.
Miles Laboratories, Inc.: *See—*
Clemens, A. H.; and Hough, David L., 4,464,170, Cl. 604-50.000.
Milewski, Witold; Brennek, Jerzy; Stanikowski, Lech; Kunicki, Wojciech; Sapiezynski, Wieslaw; Konopczynski, Andrzej; and Kondratowicz, Zbigniew, to Instytut Mechaniki Precyzyjnej. Method for spraying metallic coatings, especially on difficult accessible surfaces. 4,464,414, Cl. 427-37.000.
Miller, Gordon W.; and McClintock, Larry L., to United States of America, Air Force. EMI filter capacitor unit. 4,464,702, Cl. 361-328.000.
Miller, Helmut; Baumann, Kurt; Halder, Franz; and Meystre, Noel, to Escher Wyss Limited. Hydro-electric turbo-machine. 4,464,580, Cl. 290-52.000.
Miller, James A.; and Eagles, Derek M., to Deere & Company. Open center hydraulic system. 4,463,557, Cl. 60-422.000.
Miller, James A.; and Eagles, Derek M., to Deere & Company. Load sensing hydraulic system. 4,463,558, Cl. 60-422.000.
Miller, John R.: *See—*
Murphy, James T.; and Miller, John R., 4,464,413, Cl. 427-6.000.
Miller, Kenneth F.: *See—*
Liu, Ping Y.; and Miller, Kenneth F., 4,464,512, Cl. 525-146.000.
Miller, Leroy J.: *See—*
Lackner, Anna M.; Margerum, John D.; and Miller, Leroy J., 4,464,134, Cl. 445-24.000.
Miller, Matthew S.: *See—*
Bakanowski, Stephen M.; and Miller, Matthew S., 4,464,554, Cl. 219-10.55F.
Miller, Robert D.: *See—*
Hiraoka, Hiroyuki; Hofer, Donald C.; Miller, Robert D.; Pederson, Lester A.; and Willson, Carlton G., 4,464,460, Cl. 430-323.000.
Miller, Timothy J. E.; Jones, Donald W.; Richter, Eike; and Kalan, Gary L., to General Electric Company. Multi-section permanent magnet rotor. 4,464,596, Cl. 310-156.000.
Minato, Yoshiharu; and Tobita, Chuo, to Amada Company, Limited. Shearing machine. 4,463,642, Cl. 83-530.000.
Minh, Nguyen Q.; Loutfy, Raouf O.; and Yao, Neng-Ping, to United States of America, Energy. Production of aluminum metal by electrolysis of aluminum sulfide. 4,464,234, Cl. 204-67.000.
Minnesota Mining and Manufacturing Company: *See—*
Gerfast, Sten R., 4,464,693, Cl. 360-133.000.
Lindahl, Richard W., 4,464,672, Cl. 346-153.100.
Mailand, John J.; and Huber, Charles D., 4,463,523, Cl. 49-478.000.
Minolta Camera Kabushiki Kaisha: *See—*
Ishida, Tokuji, 4,464,039, Cl. 354-418.000.
Nanba, Yasuhiro, 4,464,038, Cl. 354-403.000.
Miroshnichenko, Anatoly G.: *See—*
Yantovsky, Leonid I.; Miroshnichenko, Anatoly G.; and Berzin, Evgeny K., 4,464,617, Cl. 318-717.000.
Misker, Jan S.; and de Vos, Jacobus A., to U.S. Philips Corporation. Office system comprising terminals, a data processor and auxiliary apparatus and a switching device for mass data transport between the auxiliary apparatus. 4,464,733, Cl. 364-900.000.
Missulovin, Leon Y.: *See—*
Vildgrube, Georgy S.; Kuturov, Boris N.; Sokolsky, Valery N.; Missulovin, Leon Y.; and Kotov, Boris A., 4,464,119, Cl. 434-185.000.
Mitarai, Tsuyoshi, to Casio Computer Co., Ltd. Power saving apparatus for electronic musical instrument. 4,463,646, Cl. 84-1.010.
Mitrofanov, Evgeny S.: *See—*
Ivanov, Nikolai A.; Ivanov, Boris G.; Zagoratsky, Leonid P.; Mitrofanov, Evgeny S.; Cherkassky, Vladimir A.; Finkelshtein, Georgy A.; Blekhman, Ilya I.; Barzukov, Oleg P.; Kaljunov, Gennady A.; Khinich, Isaak Y.; and Turkin, Vladimir Y., 4,463,908, Cl. 241-207.000.
Mitsubishi Chemical Industries Limited: *See—*
Kimura, Kuniko; Ofuchi, Kunihiko; and Oda, Koichiro, 4,464,400, Cl. 424-365.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Fukatsu, Takeo, 4,464,644, Cl. 336-90.000.
Hamano, Isao; and Tanaka, Toshinori, 4,464,595, Cl. 310-154.000.
Hosokawa, Yasuhiko; and Onishi, Shunichiro, 4,464,711, Cl. 363-87.000.
Matsumoto, Akio; Morishita, Mitsuharu; Yokota, Mitsuyoshi; and Kouge, Shinichi, 4,464,594, Cl. 310-63.000.
Mizuno, Takaji; and Shimizu, Takao, 4,464,558, Cl. 219-130.210.
Nozawa, Teruo, 4,464,628, Cl. 324-418.000.
Sato, Yoshiaki, 4,463,913, Cl. 242-57.000.
Yamagata, Shinji; Hisatsune, Fumiyuki; Terachi, Junichi; and Yoshiyasu, Hajimu, 4,464,642, Cl. 335-201.000.
Mitsubishi Rayon Company, Limited: *See—*
Kishida, Kazuo; Hasegawa, Akira; and Sugimori, Masahiro, 4,464,513, Cl. 525-227.000.
Mitsuboshi Belting Ltd.: *See—*
Tanaka, Hiroyuki; and Yamaguchi, Tadashi, 4,464,148, Cl. 474-167.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Hashimoto, Masao; and Honda, Tadatoshi, 4,464,539, Cl. 560-212.000.

Mitsuya, Kinpei: *See*—
Suzuki, Hajime; and Mitsuya, Kinpei, 4,463,783, Cl. 139-435.000.

Miyaki, Takeo: *See*—
Hatori, Masami; Ohkuma, Hiroaki; Konishi, Masataka; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,464,467, Cl. 435-119.000.

Miyata, Junji; and Matsushita, Yasuhisa, to Kubota, Ltd. Tractor transmission structure. 4,463,623, Cl. 74-473.00R.

Mizoguchi, Masao: *See*—
Asari, Akira; Noyori, Tatsuhiko; Tabuchi, Takahisa; Masuda, Tsuneharu; and Mizoguchi, Masao, 4,463,589, Cl. 72-273.500.

Mizuguchi, Mamoru: *See*—
Sekiya, Kunihiko; Mizuguchi, Mamoru; and Ohzeki, Takashi, 4,464,669, Cl. 346-76.0PH.

Mizuguchi, Yoshihiko: *See*—
Watanabe, Fumio; and Mizuguchi, Yoshihiko, 4,464,666, Cl. 343-781.00P.

Mizuno, Seiichiro: *See*—
Koyano, Akira; and Mizuno, Seiichiro, 4,463,763, Cl. 128-661.000.

Mizuno, Takaji; and Shimizu, Takao, to Mitsubishi Denki Kabushiki Kaisha. Hot wire welding system. 4,464,558, Cl. 219-130.210.

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Taniguchi, Hiroshi; Takita, Nobuhiro; Nomura, Norimasa; and Mizuta, Masaji, 4,464,036, Cl. 354-324.000.

Mlynek, Daniel, to ITT Industries, Inc. Binary MOS carry-look-ahead parallel adder. 4,464,729, Cl. 364-787.000.

Mobil Oil Corporation: *See*—
Benoit, Gordon L.; Donaldson, Jack J.; and Heilman, Paul D., 4,464,157, Cl. 493-211.000.
Colombo, Edward A.; and Sharps, Gordon V., Jr., 4,464,219, Cl. 156-251.000.
Daines, John, 4,463,894, Cl. 229-44.0EC.
Hurd, Billy G., 4,463,806, Cl. 166-274.000.
Lu, Pang-Chia, 4,464,438, Cl. 428-516.000.
Murray, James G.; and Suek, Edmond L., 4,464,514, Cl. 525-238.000.
Pann, Keh, 4,464,737, Cl. 367-49.000.
Yan, Tsoung-Yuan, 4,464,345, Cl. 423-7.000.

Mock, Russell V. Apparatus and method for continuous stacking of signatures using opposed floating conveyors. 4,463,940, Cl. 270-54.000.

Mode, Duane: *See*—
Brunone, William T.; Mode, Duane; and Russell, Michael R., 4,463,893, Cl. 229-43.000.

Moeckli, Randolph A.: *See*—
Fieldsteel, A. Howard; Cox, David L.; and Moeckli, Randolph A., 4,464,470, Cl. 435-253.000.

Mohler, Galen E., to Lexel Corporation. Laser optical mount. 4,464,763, Cl. 372-107.000.

Mohr, Robert B. Exerciser with cross-strand means joined by cross-knots. 4,463,948, Cl. 272-136.000.

Mohri, Tetsuya: *See*—
Tanouchi, Tadao; Kawamura, Masanori; Ajima, Akio; Mohri, Tetsuya; Hayashi, Masaki; Terashima, Hiroshi; Hirata, Fumio; and Morimura, Takeshi, 4,464,382, Cl. 424-270.000.

Mok, King K.: *See*—
Vasak, Vladimir; Sencar, Joze; and Mok, King K., 4,464,351, Cl. 423-486.000.

Molina, Jorge W., to Deutsch Fastener Corp. Captive fastener. 4,464,091, Cl. 411-105.000.

Molins Limited: *See*—
Arthur, High M.; Dyett, Derek H.; and Wood, Godfrey A., 4,463,766, Cl. 131-84.00R.

Molnar, Thomas G., to Repco Limited. Vehicle cushion. 4,463,984, Cl. 297-250.000.

Momose, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for making mask aligned narrow isolation grooves for a semiconductor device. 4,463,493, Cl. 29-576.00B.

Monen, Marinus J. B. M., to U.S. Philips Corporation. Method and device for writing and reading sector-organized information into and from a record carrier body. 4,464,757, Cl. 371-71.000.

Mongeon, Robert J.: *See*—
Chenausky, Peter P.; Mongeon, Robert J.; and Laughman, Lanny M., 4,464,758, Cl. 372-11.000.

Monget, Pierre; and Naffrechoux, Etienne, to Compagnie Francaise des Isolants. High-speed braiding. 4,463,652, Cl. 87-1.000.

Monhardt, Richard J.; Kudlacik, Louis; Nikkanen, John P.; and Niiler, Juri, to United Technologies Corporation. Combined surge bleed and dust removal system for a fan-jet engine. 4,463,552, Cl. 60-226.100.

Monsanto Company: *See*—
Christopfel, William C.; and Knowles, William S., 4,464,306, Cl. 260-429.00J.
Gutsche, Henry W., 4,464,222, Cl. 156-613.000.

Montedison S.p.A.: *See*—
Scata, Umberto; Albizzati, Enrico; and Giannetti, Enzo, 4,464,478, Cl. 502-111.000.

Montefina S.A.: *See*—
Castelein, Jean, 4,464,439, Cl. 428-517.000.

Montres Rado S.A.: *See*—
Gogniat, Paul, 4,464,063, Cl. 368-276.000.

Mooi, John; and Johnson, Marvin F. L., to Atlantic Richfield Company. Plural stage reforming with catalysts having a skewed distribution of a platinum-group metal and rhenium. 4,464,249, Cl. 208-65.000.

Moorcroft, Arthur L., to United States of America, Navy. Sampled towed array telemetry. 4,464,739, Cl. 367-130.000.

Moore, George G. I.: *See*—
Scherrer, Robert A.; and Moore, George G. I., 4,464,536, Cl. 546-213.000.

Moore, Michael. Method and apparatus for registration of planar members and the like through the employment of an intermediate alignment sheet. 4,463,673, Cl. 101-129.000.

Mordes, John P.; and Rossini, Aldo A. Anorexigenic composition and method. 4,464,356, Cl. 424-106.000.

Moreau, Wayne M.: *See*—
Chow, Ming-Fea; Fredericks, Edward C.; and Moreau, Wayne M., 4,464,458, Cl. 430-312.000.

Morel, Jacques. Protective device against aggressions. 4,463,685, Cl. 109-12.000.

Morelle, Jean V.; and Lauzanne-Morelle, Eliane M. T. Derivatives of lysine and aspartic acid. 4,464,397, Cl. 424-319.000.

Mori, Shinji; Fujiwara, Akinori; and Kawaharazaki, Takashi, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Webbing retractor. 4,463,917, Cl. 242-107.40A.

Morimura, Takeshi: *See*—
Tanouchi, Tadao; Kawamura, Masanori; Ajima, Akio; Mohri, Tetsuya; Hayashi, Masaki; Terashima, Hiroshi; Hirata, Fumio; and Morimura, Takeshi, 4,464,382, Cl. 424-270.000.

Morinaga, Hiroshi: *See*—
Iwabuchi, Takeshi; Morinaga, Hiroshi; Kawahara, Masao; Kamiyama, Sakae; Sato, Terumi; and Yokota, Muneto, 4,464,518, Cl. 526-127.000.

Morino, Toshiharu: *See*—
Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,464,311, Cl. 261-44.00C.

Morishita, Mitsuharu: *See*—
Matsumoto, Akio; Morishita, Mitsuharu; Yokota, Mitsuyoshi; and Kouge, Shinichi, 4,464,594, Cl. 310-63.000.

Moriyasu, Toshinori; and Nakai, Masanori, to Tokyo Shibaura Denki Kabushiki Kaisha. IL Buffer having higher breakdown levels. 4,464,589, Cl. 307-477.000.

Morkoetter, James G.: *See*—
Barnes, James E.; Morkoetter, James G.; and Robbins, Norman M., 4,463,631, Cl. 81-3.10R.

Morohoshi, Hideo: *See*—
Ohta, Saburo; Nakamura, Shoji; Hayashi, Katsutake; Yomogida, Katsuyuki; Morohoshi, Hideo; Hirose, Seiichi; Uehara, Keiichi; Aizawa, Masanori; Sato, Yoshihisa; Ichikawa, Hideyuki; Tejima, Masayuki; and Togano, Seisaku, 4,464,290, Cl. 252-522.00R.

Moron, Jacqueline: *See*—
Bisagni, Emile; Dubertret, Louis; Moron, Jacqueline; Averbeck, Dietrich; Papadopoulo, Dora; Blais, Jocelyne; Vigny, Paul; Schwencke, Maria N.; Moustacchi, Ethel; Nocentini, Silvano; and Zajdela, Francois, 4,464,354, Cl. 424-59.000.

Morozumi, Eiichi: *See*—
Kojima, Tadashi; Uchihama, Tetsuo; Tanaka, Kazuyoshi; Morozumi, Eiichi; Inoue, Kentaro; and Shito, Naomichi, 4,463,773, Cl. 137-38.000.

Morris, Harold. Rotary prime mover. 4,463,551, Cl. 60-39.350.

Morrow, Richard A.: *See*—
Troutner, Vernon H.; and Morrow, Richard A., 4,464,164, Cl. 604-5.000.

Moschter, Erwin: *See*—
Dost, Gerhard; Gerber, Walter; Jaeger, Eberhard; Moschter, Erwin; and Weiss, Richard, 4,464,432, Cl. 428-280.000.

Moser, Manfred: *See*—
Gruber, Heinz; Kutz, Johannes; and Moser, Manfred, 4,463,467, Cl. 8-151.000.
Kruger, Max; and Moser, Manfred, 4,463,583, Cl. 68-205.00R.

Mosher, Carol W.; Tong, George L.; and Acton, Edward M., to SRI International. Analogues of morpholinyl daunorubicin and morpholinyl doxorubicin. 4,464,529, Cl. 536-6.400.

Motooka, Teruaki: *See*—
Munakata, Chusuke; Yagi, Kunihiro; and Motooka, Teruaki, 4,464,627, Cl. 324-158.00R.

Motorola, Inc.: *See*—
Eness, Orville M., 4,464,791, Cl. 455-67.000.
Smith, Stephen L., 4,464,736, Cl. 365-200.000.
Sorensen, Bendt H., 4,464,771, Cl. 375-120.000.

Mott, Jonathan C. Warning devices. 4,463,702, Cl. 116-63.00R.

Motz, Herbert: *See*—
Autzen, Horst; Motz, Herbert; Rudolf, Peter; Sarnecki, Wilhelm; Steck, Werner; and Vaeth, Guenter, 4,464,352, Cl. 423-634.000.

Mountain, Craig S.; and Drunasky, Thomas D. Diving tank handle. 4,463,978, Cl. 294-31.200.

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Bisagni, Emile; Dubertret, Louis; Moron, Jacqueline; Averbeck, Dietrich; Papadopoulo, Dora; Blais, Jocelyne; Vigny, Paul; Schwencke, Maria N.; Moustacchi, Ethel; Nocentini, Silvano; and Zajdela, Francois, 4,464,354, Cl. 424-59.000.

Mowbray, Dorian F., to Lucas Industries Public Limited Company. Fuel injection pumping apparatus. 4,464,099, Cl. 417-510.000.

Mrachek, Stephen J.: *See*—
Zimmerman, Valentine; and Mrachek, Stephen J., 4,463,687, Cl. 110-233.000.

Muanyagipari Kutato Intezet: *See*—
Czvikovszky, Tibor J.; Pazonyi, Tamas; Topolcai, Laszlone I.; and Kleban, Janos, 4,464,510, Cl. 525-54.230.

Muanyagipari Kutato Intezet and Hutogepgyar: *See*—
Kocsis, Jozsef K.; Kiss, Laszlo ; Balajthy, Zoltan; Nagy, Peter; Pai nee Hazkoto, Gizella; Zarubai, Miklos; Sipos, Geza; Romhanyi, Andras; and Kokai, Rudolf, 4,464,504, Cl. 524-443.000.
Mucheyer, Norbert; and Schulte, Heinz, to Mannesmann Rexroth GmbH. Multi-way valve. 4,463,660, Cl. 91-469.000.
Mueller, Albert: *See*—
Dantlgraber, Joerg; and Mueller, Albert, 4,463,929, Cl. 251-44.000.
Mueller, Herbert, to BASF Aktiengesellschaft. Preparation of polycaprolactone. 4,464,526, Cl. 528-358.000.
Muench, Volker: *See*—
Naarmann, Herbert; Penzien, Klaus; Muench, Volker; and Franz, Klaus-Dieter, 4,464,511, Cl. 525-61.000.
Mukaida, Yutaka: *See*—
Takita, Hitoshi; Mukaida, Yutaka; Noda, Sakuo; and Kobayashi, Hidetoshi, 4,464,396, Cl. 424-319.000.
Mukunoki, Yasuo: *See*—
Sugimoto, Naohiko; Kojima, Tetsuro; and Mukunoki, Yasuo, 4,464,462, Cl. 430-512.000.
Muller, Jean-Marc, to Stellram S.A. Cutting tool. 4,464,087, Cl. 407-113.000.
Muller, Linda L.: *See*—
Jacks, Thomas J.; Hensarling, Thomas P.; and Muller, Linda L., 4,464,296, Cl. 260-123.500.
Mullet, Willis J. Sheet material roofing panel. 4,463,533, Cl. 52-394.000.
Mullin, John B.; Holliday, Arthur K.; Cole-Hamilton, David J.; and Jones, Anthony C., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defense in Her Britannic Majesty's Government of the. Preparation of adducts which may be used in the preparation of compound semiconductor materials. 4,464,233, Cl. 204-59.0QM.
Multiform Desiccants, Inc.: *See*—
Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., 4,464,261, Cl. 210-282.000.
Munakata, Chusuke; Yagi, Kunihiro; and Motooka, Teruaki, to Hitachi, Ltd. Device for measuring semiconductor characteristics. 4,464,627, Cl. 324-158.00R.
Mundell, David D.: *See*—
Arnold, Harmon W.; Erwin, Galen B.; Gowing, John P.; and Mundell, David D., 4,464,218, Cl. 156-244.120.
Mundt, Arnold L.; and Nguyen, Gioan, to BS&B Safety Systems, Inc. Knife blade apparatus for severing rupture disks. 4,463,865, Cl. 220-89.00A.
Munson, Arthur E.: *See*—
Reich, Ronald S.; Held, Jimmy L.; Munson, Arthur E.; and Hartley, James R., 4,463,496, Cl. 30-180.000.
Munson, Robert E.: *See*—
Lalezari, Farzin; and Munson, Robert E., 4,464,663, Cl. 343-700.0MS.
Munteanu, Marina A.; Cseko, Christine; Oltarzewski, Edward S.; Lindauer, Jerome I.; and Withycombe, Donald A., to International Flavors & Fragrances Inc. Liquid or solid fabric softener composition comprising microencapsulated fragrance suspension and process for preparing same. 4,464,271, Cl. 252-8.600.
Muralidhara, Ranya: *See*—
Pittet, Alan O.; Vock, Manfred H.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,464,408, Cl. 426-535.000.
Murase, Kiyoshi; Mase, Toshiyasu; Arima, Hideki; Niigata, Kunihiro; Tomioka, Kenichi; and Kobayashi, Shinichiro, to Yamanouchi Pharmaceutical Co., Ltd. 2-Phenylimidazo[2,1-b]benzothiazole compounds, salts thereof, process of producing them, and pharmaceutical compositions containing them. 4,464,384, Cl. 424-270.000.
Murase, Noriyoshi, to Kabushiki Kaisha Kobe Seiko Sho. Mounting structure for mounting nozzle body of special material. 4,463,868, Cl. 220-288.000.
Murata Kikai Kabushiki Kaisha: *See*—
Kiriake, Masaharu; and Shimano, Akira, 4,463,909, Cl. 242-35.50A.
Murata Manufacturing Co., Ltd.: *See*—
Nishikawa, Toshio; Tamura, Sadahiro; and Tamura, Hiroshi, 4,464,640, Cl. 333-202.000.
Senda, Atsuo; Kato, Suehiro; and Kasanami, Toru, 4,464,422, Cl. 427-124.000.
Murphy, Edward J., to DeSoto, Inc. Chromic acid-ionic ethylenically unsaturated complexes and polymers containing the same. 4,464,436, Cl. 428-463.000.
Murphy, James T.; and Miller, John R., to United States of America, Energy. Method and apparatus for producing cryogenic targets. 4,464,413, Cl. 427-6.000.
Murphy, Joseph, to United States of America, Army. Thin film electroluminescent device. 4,464,602, Cl. 313-509.000.
Murphy, Michael K.: *See*—
Murphy, Richard F.; and Murphy, Michael K., 4,463,835, Cl. 188-52.000.
Murphy, Richard F.; and Murphy, Michael K., 4,463,836, Cl. 188-52.000.
Murphy, Richard F.; and Murphy, Michael K., to Holland Co. Slide bearing attachment for U-section type unit brake beam guide lugs. 4,463,835, Cl. 188-52.000.
Murphy, Richard F.; and Murphy, Michael K., to Holland Co. Snap-on slide bearing for U-section type unit brake beam guide lugs. 4,463,836, Cl. 188-52.000.
Murray, James G.; and Suek, Edmond L., to Mobil Oil Corporation. High clarity blends of polyvinyl chloride and para-methylstyrene-acrylonitrile copolymer. 4,464,514, Cl. 525-238.000.
Muryobayashi, Takashi: *See*—
Sakai, Yoshiki; Imaki, Katsuhiro; and Muryobayashi, Takashi, 4,464,388, Cl. 424-275.000.
Myers, Virginia K.; McKay, Bill E., Jr.; and Busch, Lloyd E., to Ashland Oil, Inc. Stripping hydrocarbons from catalyst with combustion gases. 4,464,250, Cl. 208-120.000.
Naarmann, Herbert; Penzien, Klaus; Muench, Volker; and Franz, Klaus-Dieter, to BASF Aktiengesellschaft. Polymers which have two or more stable, reversibly interconvertible oxidation states, their preparation and their use. 4,464,511, Cl. 525-61.000.
Naffrechoux, Etienne: *See*—
Monget, Pierre; and Naffrechoux, Etienne, 4,463,652, Cl. 87-1.000.
Nagai, Shigeki: *See*—
Kobayashi, Shinsaku; Kamoshita, Katsuo; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Takashi; and Kojima, Mikio, 4,464,375, Cl. 424-251.000.
Nagai, Yataro; and Imai, Yoshiro, to Tanken Seiko Corp. Sealing device for rotary shaft and string-like member for defining spiral therefor. 4,463,957, Cl. 277-34.000.
Nagai, Yoshitoshi, to Tomy Kogyo Company, Inc. Toy having pivoting members. 4,463,514, Cl. 446-294.000.
Nagasaka, Tatsuo: *See*—
Ohki, Sadao; Hamaguchi, Fumiko; Nagasaka, Tatsuo; and Kikuchi, Hiroyuki, 4,464,361, Cl. 424-180.000.
Nagashima, Junnosuke: *See*—
Hisaki, Hisao; Nagashima, Junnosuke; and Kanno, Katsuo, 4,464,431, Cl. 428-266.000.
Nagel, Dieter H., to Heinz Plastic Mold Co. Plastic container with easily removable, integrally formed cap. 4,463,867, Cl. 220-270.000.
Nagel, Dietmar: *See*—
Romero, Hugo; Arad, Avi; Nagel, Dietmar; and Kennedy, Melvin, 4,464,124, Cl. 434-321.000.
Nagpal, Krishen L., to Buffalo Color Corp. Insecticidal phenyl hydantoin compounds. 4,464,387, Cl. 424-273.00R.
Nagy, Peter: *See*—
Kocsis, Jozsef K.; Kiss, Laszlo ; Balajthy, Zoltan; Nagy, Peter; Pai nee Hazkoto, Gizella; Zarubai, Miklos; Sipos, Geza; Romhanyi, Andras; and Kokai, Rudolf, 4,464,504, Cl. 524-443.000.
Naito, Jiro: *See*—
Yoneda, Yasuhiro; Kitamura, Kenroh; Naito, Jiro; and Kitakohji, Toshisuke, 4,464,455, Cl. 430-270.000.
Nakada, Seiichi; Yoshikawa, Hiromi; Ohno, Hiroshi; Nishijima, Tsuneo; and Kawakami, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Vacuum cleaner. 4,463,473, Cl. 15-339.000.
Nakagawa, Katsumi: *See*—
Koumura, Noboru; Komatsu, Toshiyuki; Nakagawa, Katsumi; Takekawa, Nobuhiro; and Fujii, Motoharu, 4,464,043, Cl. 355-14.00C.
Nakai, Masanori: *See*—
Moriyasu, Toshinori; and Nakai, Masanori, 4,464,589, Cl. 307-477.000.
Nakajima, Toshio: *See*—
Noda, Yuzuru; and Nakajima, Toshio, 4,464,489, Cl. 521-117.000.
Nakajima, Yasuyuki: *See*—
Ozawa, Kiyomi; Nakajima, Yasuyuki; Tsugeno, Makoto; Ishii, Shigeru; and Hatanaka, Masataka, 4,464,386, Cl. 424-273.00P.
Nakamura, Kazumasa: *See*—
Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, 4,463,822, Cl. 180-177.000.
Nakamura, Ken: *See*—
Haneda, Satoshi; Ito, Takashi; Nakamura, Ken; and Tomoeo, Makoto, 4,464,041, Cl. 355-3.0DD.
Nakamura, Makoto, to Nissan Motor Company, Limited. Hydraulic lifter. 4,463,714, Cl. 123-90.570.
Nakamura, Masakazu, to Takeda Riken Kogyo Kabushiki Kaisha. Waveform display apparatus. 4,464,656, Cl. 340-728.000.
Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, to Toyota Jidosha Kabushiki Kaisha; and Aisin Industry Co., Ltd. Variable venturi-type carburetor. 4,464,311, Cl. 261-44.00C.
Nakamura, Shoji: *See*—
Ohta, Saburo; Nakamura, Shoji; Hayashi, Katsutake; Yomogida, Katsuyuki; Morohoshi, Hideo; Hirose, Seiichi; Uehara, Keiichi; Aizawa, Masanori; Sato, Yoshihisa; Ichikawa, Hideyuki; Tejima, Masayuki; and Togano, Seisaku, 4,464,290, Cl. 252-522.00R.
Nakamura, Yasushi: *See*—
Nishito, Akihiro; Ohtombe, Ko; Yamakawa, Susumu; and Nakamura, Yasushi, 4,464,786, Cl. 382-7.000.
Nakamura, Zenzo; Uchiyama, Takashi; Ohtaki, Shohei; Tsunekawa, Tokuichi; Uchidoi, Masanori; and Mashimo, Yukio, to Canon Kabushiki Kaisha. Flash lighting unit for a camera. 4,464,609, Cl. 315-241.00P.
Nakashima, Shinobu: *See*—
Fujikawa, Junichi; Mataki, Hiroshi; Tanaka, Chiaki; and Nakashima, Shinobu, 4,464,456, Cl. 430-281.000.
Nakashima, Sumio: *See*—
Sato, Takahisa; Nakashima, Sumio; and Baba, Masao, 4,464,229, Cl. 203-60.000.
Nakashima, Toshitaka: *See*—
Ueno, Ryuzo; Kanayama, Tatsuo; Tomiyasu, Kunihiko; Fujikami, Asao; and Nakashima, Toshitaka, 4,464,404, Cl. 426-332.000.
Nakasho, Kazuo, to Olympus Optical Co., Ltd. Indicator device. 4,464,794, Cl. 455-157.000.
Nakaya, Masato: *See*—
Funada, Ryuichi; and Nakaya, Masato, 4,464,278, Cl. 252-62.540.

Nakayama, Takashi: *See*—
Kajita, Koji; Nakayama, Takashi; and Yamagata, Seiichi, 4,463,549, Cl. 57-328.000.
Nalco Chemical Company: *See*—
Roensch, L. Fred, 4,464,228, Cl. 203-49.000.
Nanba, Yasuhiro, to Minolta Camera Kabushiki Kaisha. Distance measuring device for use in a camera. 4,464,038, Cl. 354-403.000.
Nanno, Kunio: *See*—
Takayanagi, Shinji; Kato, Yoshitaka; Nanno, Kunio; Yasunaga, Osamu; Takeuchi, Osamu; Yamamoto, Ryozo; Iwai, Kazuhiro; and Kasai, Hiroshi, 4,463,964, Cl. 280-284.000.
Nash, James G., to Hughes Aircraft Company. Charge coupled device ripple adder with nearly instantaneous carry propagation. 4,464,728, Cl. 364-786.000.
National Latex Products Company, The: *See*—
Kerr, Douglas S.; and Lowe, Gerald A., 4,463,517, Cl. 446-421.000.
National Nuclear Corporation Limited: *See*—
Yellowlees, John M., 4,463,872, Cl. 220-428.000.
National Research Development Corporation: *See*—
Elliott, Michael; Janes, Norman F.; and Pulman, David A., 4,464,391, Cl. 424-304.000.
Vitols, Reinhards; Walkinshaw, Steven; and Wray, Gordon R., 4,463,581, Cl. 66-87.000.
National Semiconductor Corporation: *See*—
Rapp, A. Karl, 4,464,590, Cl. 307-530.000.
Rapp, A. Karl, 4,464,591, Cl. 307-530.000.
Russell, Gilbert E.; and Wong, Hee, 4,464,676, Cl. 358-37.000.
Wieser, James B., 4,464,588, Cl. 307-297.000.
National Starch and Chemical Corporation: *See*—
Neigel, Dennis; and Kancylarz, John, 4,464,523, Cl. 527-300.000.
Nayfa, James E. Grit seal for cotton gin roller bar. 4,463,479, Cl. 19-48.00A.
Neal, Mathew: *See*—
Backes, Reiner; Schmidtpott, Friedrich; and Neal, Mathew, 4,464,773, Cl. 377-116.000.
Nedelec, Lucien; and Torelli, Vesperto, to Roussel Uclaf. 17-[(Hydroxymethyl)formamido-methylene]-steroids. 4,464,302, Cl. 260-397.100.
Neely, Jack D.: *See*—
Dixon, Jerry D.; Farrell, Robert H.; Merckel, Gerald U.; Neely, Jack D.; Schmitt, Stephen A.; Verdoorn, William G., Jr.; and Bandy, Peter B., 4,464,718, Cl. 364-200.000.
Neigel, Dennis; and Kancylarz, John, to National Starch and Chemical Corporation. Process for the preparation of graft copolymers of cellulose derivatives and diallyl, dialkyl ammonium halides. 4,464,523, Cl. 527-300.000.
Neki, Shigeo: *See*—
Shinozaki, Nozomu; Dohi, Takashi; and Neki, Shigeo, 4,463,698, Cl. 112-275.000.
Nelson, Roger J., to Deere & Company. Cylinder stroke limiter. 4,463,659, Cl. 91-404.000.
Nemes, Andras: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Kreidl, Janos; Nemes, Andras; Farkas nee Kirjak, Maria; Visky, Gyorgy; and Czibula, Laszlo , 4,464,534, Cl. 546-51.000.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Kreidl, Janos; Visky, Gyorgy; Nemes, Andras; Czibula, Laszlo ; and Farkas nee Kirjak, Maria, 4,464,535, Cl. 546-51.000.
Nemzek, Thomas L.; and Geelan, Brendan J., to Uniroyal, Inc. Nonyellowing polymer composition. 4,464,496, Cl. 524-91.000.
Neumann, Don B. Differential holographic interferometry. 4,464,052, Cl. 356-347.000.
New England Envelope Mfg. Co.: *See*—
Pasquale, William D., 4,463,895, Cl. 229-49.000.
New England Machinery, Inc.: *See*—
Iosfescu, Alexandru D., 4,463,846, Cl. 198-399.000.
Newall, Christopher E.: *See*—
O'Callaghan, Cynthia H.; Ayres, Barry E.; Newall, Christopher E.; Livermore, David G. H.; and Sutherland, Derek R., 4,464,368, Cl. 424-246.000.
Newlin, Larry L.: *See*—
Brown, Graydon L.; and Newlin, Larry L., 4,464,568, Cl. 250-253.000.
Newsome, John R. Hollow needle for card separation. 4,463,942, Cl. 271-12.000.
Nguyen, Gioan: *See*—
Mundt, Arnold L.; and Nguyen, Gioan, 4,463,865, Cl. 220-89.00A.
NHK Spring Co., Ltd.: *See*—
Shinbori, Takeyoshi; Takadera, Ichiro; and Fukumura, Takeo, 4,463,936, Cl. 267-36.00A.
Ni Industries, Inc.: *See*—
Beisch, Hans R., 4,463,990, Cl. 301-37.0SS.
Niblett, Norman C. Fuel preheater with vapor lock prevention means. 4,463,739, Cl. 123-557.000.
Nichols, James H., Jr.; Furey, Roger J.; Englar, Robert J.; and Lee, David G., to United States of America, Navy. Thrust deflector and force augmentor. 4,463,920, Cl. 244-207.000.
Niekamp, Carl W.; and Seidman, Martin, to A. E. Staley Manufacturing Company. Alkylidenation of fructose with perfluorinated acid catalysts. 4,464,204, Cl. 127-36.000.
Nielsen, Arne, to Sig Societe Industrielle Suisse. Railway track tamping machine. 4,463,682, Cl. 104-12.000.
Nielsen, John P. Nobleization of beta brass. 4,464,213, Cl. 148-442.000.
Nightingale, Douglas J., to Rolls-Royce Inc. Variable geometry nozzle with thrust reverser for a turbomachine. 4,463,902, Cl. 239-265.170.
Nightingale, Douglas J. Turbomachine ejector nozzle. 4,463,903, Cl. 239-265.170.
Nihon Technical Kabushiki Kaisha: *See*—
Ohashi, Tamaki, 4,463,618, Cl. 74-10.330.
Niigata, Kunihiro: *See*—
Murase, Kiyoshi; Mase, Toshiyasu; Arima, Hideki; Niigata, Kunihiro; Tomioka, Kenichi; and Kobayashi, Shinichiro, 4,464,384, Cl. 424-270.000.
Niiler, Juri: *See*—
Monhardt, Richard J.; Kudlacik, Louis; Nikkanen, John P.; and Niiler, Juri, 4,463,552, Cl. 60-226.100.
Nikkanen, John P.: *See*—
Monhardt, Richard J.; Kudlacik, Louis; Nikkanen, John P.; and Niiler, Juri, 4,463,552, Cl. 60-226.100.
Nilsson, Claes T.: *See*—
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,464,106, Cl. 425-525.000.
Nippon Electric Co., Ltd.: *See*—
Shimizu, Hiroshi, 4,464,765, Cl. 375-17.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Kondo, Masao; and Kumano, Shinji, 4,464,325, Cl. 264-229.000.
Tokushima, Tadao, 4,463,649, Cl. 84-1.180.
Nippon Kayaku Kabushiki Kaisha: *See*—
Takei, Yukio; Yoshida, Masao; and Nishizawa, Rinzo, 4,464,532, Cl. 544-237.000.
Nippon Kogaku K.K.: *See*—
Terui, Nobuhiko; and Okabe, Nobuo, 4,464,037, Cl. 354-400.000.
Tomino, Naoki, 4,464,034, Cl. 354-286.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Taira, Tadaaki; Takehara, Junichiro; Kobayashi, Yasuo; and Ume, Kazuyoshi, 4,464,209, Cl. 148-36.000.
Nippon Shokubai Kagaku Kogyo Co. Ltd.: *See*—
Sato, Takahisa; Nakashima, Sumio; and Baba, Masao, 4,464,229, Cl. 203-60.000.
Nippon Soken, Inc.: *See*—
Kitagawa, Junji; Akita, Shigeyuki; and Kitamura, Sotoo, 4,463,604, Cl. 73-296.000.
Tomita, Masahiro; and Tsukao, Toshiyuki, 4,464,185, Cl. 55-310.000.
Nippondenso Co., Ltd.: *See*—
Sagisaka, Yasuo; Fukue, Naofumi; and Kondo, Toshio, 4,463,740, Cl. 123-568.000.
Nishihara, Minoru: *See*—
Wakano, Shigeru; Sakoda, Akito; Fukui, Kunihiro; and Nishihara, Minoru, 4,464,232, Cl. 204-28.000.
Nishihata, Toshiaki: *See*—
Higuchi, Takeru; Nishihata, Toshiaki; and Rytting, Howard J., 4,464,363, Cl. 424-232.000.
Nishihira, Toshihiro, to Fuji Rubber Co. Ltd. Method of manufacturing contact rubber structure. 4,464,326, Cl. 264-246.000.
Nishijima, Tsuneo: *See*—
Nakada, Seiichi; Yoshikawa, Hiromi; Ohno, Hiroshi; Nishijima, Tsuneo; and Kawakami, Hiroshi, 4,463,473, Cl. 15-339.000.
Nishikawa, Masumi, to Aisin Seiki Kabushiki Kaisha. Telescopic steering apparatus for vehicles. 4,463,625, Cl. 74-493.000.
Nishikawa, Masumi: *See*—
Kazaoka, Kenichi; Okuyama, Teiji; and Nishikawa, Masumi, 4,463,626, Cl. 74-493.000.
Nishikawa, Toshio; Tamura, Sadahiro; and Tamura, Hiroshi, to Murata Manufacturing Co., Ltd. Distribution constant type filter. 4,464,640, Cl. 333-202.000.
Nishimura, Kosuke, to Sharp Kabushiki Kaisha. Variable retrieval speed/direction electronic translator. 4,464,731, Cl. 364-900.000.
Nishino, Yukeshige: *See*—
Hofmeister, Helmut; Petzoldt, Karl; Annen, Klaus; Laurent, Henry; Wiechert, Rudolf; and Nishino, Yukeshige, 4,464,365, Cl. 424-243.000.
Nishito, Akihiro; Ohtombe, Ko; Yamakawa, Susumu; and Nakamura, Yasushi, to Tokyo Shibaura Denki Kabushiki Kaisha. System for identifying currency note. 4,464,786, Cl. 382-7.000.
Nishizawa, Rinzo: *See*—
Takei, Yukio; Yoshida, Masao; and Nishizawa, Rinzo, 4,464,532, Cl. 544-237.000.
Nissan Chemical Industries, Ltd.: *See*—
Iwabuchi, Takeshi; Morinaga, Hiroshi; Kawahara, Masao; Kamiyama, Sakae; Sato, Terumi; and Yokota, Muneto, 4,464,518, Cl. 526-127.000.
Ozawa, Kiyomi; Nakajima, Yasuyuki; Tsugeno, Makoto; Ishii, Shigeru; and Hatanaka, Masataka, 4,464,386, Cl. 424-273.00P.
Nissan Motor Company, Limited: *See*—
Hayashi, Yoshimasa; and Shimada, Kiyoshi, 4,463,721, Cl. 123-378.000.
Nakamura, Makoto, 4,463,714, Cl. 123-90.570.
Shibata, Junichi; Sanada, Yuichi; and Shingyooji, Shigeo, 4,463,624, Cl. 74-493.000.
Uchida, Masaaki; and Isitani, Shigeo, 4,464,244, Cl. 204-425.000.
Nittel, Fritz: *See*—
Matejec, Reinhart; Nittel, Fritz; and Sobel, Johannes, 4,464,464, Cl. 430-546.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Noda, Yuzuru; and Nakajima, Toshio, 4,464,489, Cl. 521-117.000.
Niwa, Hazime; and Furukawa, Saburo, to Aoi Chemical, Inc. Concrete joint sealant plate and process for manufacturing thereof. 4,464,424, Cl. 427-296.000.
Niwa, Yutaka: *See*—
Taniguthi, Tatsuhito; Niwa, Yutaka; and Masumoto, Takashi, 4,463,777, Cl. 137-553.000.

NL Industries, Inc.: *See*—
Mason, Carl E.; and Geffen, Samuel E., 4,463,808, Cl. 166-292.000.
Nocentini, Silvano: *See*—
Bisagni, Emile; Dubertret, Louis; Moron, Jacqueline; Averbeck, Dietrich; Papadopoulo, Dora; Blais, Jocelyne; Vigny, Paul; Schwencke, Maria N.; Moustacchi, Ethel; Nocentini, Silvano; and Zajdela, Francois, 4,464,354, Cl. 424-59.000.
Noda, Sakuo: *See*—
Takita, Hitoshi; Mukaida, Yutaka; Noda, Sakuo; and Kobayashi, Hidetoshi, 4,464,396, Cl. 424-319.000.
Noda, Yuzuru; and Nakajima, Toshio, to Nitto Electric Industrial Co., Ltd. Method for the production of polyimide powder. 4,464,489, Cl. 521-117.000.
Noding, Stephen A., to Dow Chemical Company, The. Selective electrochemical oxidation of organic compounds. 4,464,236, Cl. 204-78.000.
Noe, Manfred: *See*—
Ebert, Heinrich; Noe, Manfred; Wind, Kurt; and Kirsch, Wilhelm, 4,464,428, Cl. 428-95.000.
Noe, Renato R.: *See*—
Garbarini, Philip P.; and Noe, Renato R., 4,463,871, Cl. 220-378.000.
Noguchi, Yukio: *See*—
Aragaki, Tsunehide; and Noguchi, Yukio, 4,464,582, Cl. 307-118.000.
Nokami, Junzo: *See*—
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Shiroi, Takashi; Sasaoka, Michio; and Saito, Norio, 4,464,237, Cl. 204-81.000.
Nomura, Norimasa: *See*—
Taniguchi, Hiroshi; Takita, Nobuhiro; Nomura, Norimasa; and Mizuta, Masaji, 4,464,036, Cl. 354-324.000.
Nordischer Maschinenbau Rud. Baader GmbH & Co KG: *See*—
Hartmann, Franz; and Heinen, Gottfried, 4,463,478, Cl. 17-63.000.
Norman, Edward C.: *See*—
Chiesa, Peter J., Jr.; and Norman, Edward C., 4,464,267, Cl. 252-8.050.
Norrman, Bengt F.: *See*—
Tuovinen, Frans H.; Norrman, Bengt F.; Heikkila, Risto M.; and Honkaniemi, Matti E., 4,464,764, Cl. 373-87.000.
Nors A/S of America, Inc.: *See*—
Ball, Joel E.; and Ball, Brian R., 4,463,885, Cl. 224-250.000.
North American Foreign Trading Corporation: *See*—
Romero, Hugo; Arad, Avi; Nagel, Dietmar; and Kennedy, Melvin, 4,464,124, Cl. 434-321.000.
Northwest Alaskan Pipeline Company: *See*—
Isaacs, Ralph M., 4,464,082, Cl. 405-157.000.
Norton, Peter. Angular displacement transducer of the variable reluctance type. 4,464,645, Cl. 336-135.000.
Norwell, John B. Cleaning device for golf clubs. 4,464,072, Cl. 401-137.000.
Novak, Raymond F.: *See*—
Geist, Bernard W.; Frank, Edmund; Doyle, Richard H.; and Novak, Raymond F., 4,463,888, Cl. 227-109.000.
Novikov, Vasily V.: *See*—
Surovikin, Vitaly F.; Antonenko, Vladimir F.; Babich, Gennady V.; Bobrik, Mikhail Y.; Korenyak, Nikolai K.; Novikov, Vasily V.; Voloshin, Gennady A.; Belyaev, Georgy A.; Gordeev, Alexandr V.; Gallyamov, Nail I.; and Krikunenko, Anatoly F., 4,464,314, Cl. 261-79.00A.
Nowacki, Ulrich G., to International Paper Company. Apparatus and method for automatically packing articles in catons. 4,463,541, Cl. 53-447.000.
Nowak, Herbert: *See*—
Hermann, Wolfgang; Ruter, Bernhard; Gorris, Rainer; and Nowak, Herbert, 4,463,690, Cl. 110-336.000.
Noyori, Tatsuhiko: *See*—
Asari, Akira; Noyori, Tatsuhiko; Tabuchi, Takahisa; Masuda, Tsuneharu; and Mizoguchi, Masao, 4,463,589, Cl. 72-273.500.
Nozaki, Mineo; Ozawa, Toshiaki; Asakura, Osamu; Kondo, Hiroatsu; and Okamura, Shigeru, to Canon Kabushiki Kaisha. Printing apparatus having stain preventing means. 4,463,672, Cl. 101-93.090.
Nozawa, Takamitsu: *See*—
Yoshino, Yataro; Tsukada, Takami; Saito, Tadao; and Nozawa, Takamitsu, 4,463,860, Cl. 215-12.00R.
Nozawa, Teruo, to Mitsubishi Denki Kabushiki Kaisha. Relay tester. 4,464,628, Cl. 324-418.000.
NPI New Products Investment AB: *See*—
Swallert, Sven A., 4,463,876, Cl. 222-94.000.
Nussli, Armin; and Hauser, Hans-Peter, to Bron Electronic AG. Lighting fixture. 4,464,708, Cl. 362-300.000.
Obrecht, Margretta: *See*—
Fuller, Berkeley; Soll, Linda; Obrecht, Margretta; Poole, Gary; Campbell, Edward F., Jr.; Parsons, Margaret; Chun, Valerie P. P.; Shearer, David R.; and Cashman, Thomas M., 4,464,122, Cl. 434-262.000.
O'Brien, John P., to Du Pont de Nemours, E. I., and Company. Process for preparing high strength cellulosic fibers. 4,464,323, Cl. 264-187.000.
O'Brien, William D.: *See*—
Becker, Michael T.; and O'Brien, William D., 4,463,674, Cl. 101-148.000.
O'Callaghan, Cynthia H.; Ayres, Barry E.; Newall, Christopher E.; Livermore, David G. H.; and Sutherland, Derek R., to Glaxo Group Limited. Cephalosporin antibiotics. 4,464,368, Cl. 424-246.000.
Ochoa, Pedro S.; and Cortes, Pedro S. Safety barriers for highways and the like. 4,463,934, Cl. 256-13.100.
Oda, Kiroku: *See*—
Kobayashi, Shinsaku; Kamoshita, Katsuo; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Takashi; and Kojima, Mikio, 4,464,375, Cl. 424-251.000.
Oda, Koichiro: *See*—
Kimura, Kuniko; Ofuchi, Kunihiko; and Oda, Koichiro, 4,464,400, Cl. 424-365.000.
Oehy, Peter; and Schmid, Rene, to Rieter Machine Works, Ltd. Apparatus and method for changing cans on a spinning preparatory machine. 4,463,480, Cl. 19-159.00A.
Office National d'Etudes et de Recherches Aerospatiales: *See*—
Boudigues, Serge, 4,463,553, Cl. 60-268.000.
Ofuchi, Kunihiko: *See*—
Kimura, Kuniko; Ofuchi, Kunihiko; and Oda, Koichiro, 4,464,400, Cl. 424-365.000.
Ogawa, Yasuhiro: *See*—
Masui, Michio; Ogawa, Yasuhiro; and Esumi, Kunio, 4,464,696, Cl. 361-42.000.
Ogura, Kenzi: *See*—
Makino, Tetsuya; Itazawa, Masakatsu; and Ogura, Kenzi, 4,464,517, Cl. 526-88.000.
O'Hara, Mark J.: *See*—
Hilfman, Lee; and O'Hara, Mark J., 4,464,481, Cl. 502-228.000.
Ohashi, Tamaki, to Nihon Technical Kabushiki Kaisha. Pushbutton tuner. 4,463,618, Cl. 74-10.330.
Ohki, Sadao; Hamaguchi, Fumiko; Nagasaka, Tatsuo; and Kikuchi, Hiroyuki, to Fujisawa Pharmaceutical Co., Ltd. Adenosine derivatives. 4,464,361, Cl. 424-180.000.
Ohkuma, Hiroaki: *See*—
Hatori, Masami; Ohkuma, Hiroaki; Konishi, Masataka; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,464,467, Cl. 435-119.000.
Ohno, Fumiaki: *See*—
Ono, Tsuyoshi; and Ohno, Fumiaki, 4,464,740, Cl. 369-41.000.
Ohno, Hiroshi: *See*—
Nakada, Seiichi; Yoshikawa, Hiromi; Ohno, Hiroshi; Nishijima, Tsuneo; and Kawakami, Hiroshi, 4,463,473, Cl. 15-339.000.
Ohsima, Ken: *See*—
Kato, Kiichi; Sakamoto, Masaharu; Yoshikawa, Shoji; Yamamiya, Kunio; Kodama, Hiroshi; and Ohsima, Ken, 4,464,050, Cl. 356-237.000.
Ohta, Saburo; Nakamura, Shoji; Hayashi, Katsutake; Yomogida, Katsuyuki; Morohoshi, Hideo; Hirose, Seiichi; Uehara, Keiichi; Aizawa, Masanori; Sato, Yoshihisa; Ichikawa, Hideyuki; Tejima, Masayuki; and Togano, Seisaku, to Shiseido Company Ltd. Hypo-allergenic jasmine oil process for producing the same and composition containing the same. 4,464,290, Cl. 252-522.00R.
Ohtaki, Shohei: *See*—
Nakamura, Zenzo; Uchiyama, Takashi; Ohtaki, Shohei; Tsunekawa, Tokuichi; Uchidoi, Masanori; and Mashimo, Yukio, 4,464,609, Cl. 315-241.00P.
Ohtombe, Ko: *See*—
Nishito, Akihiro; Ohtombe, Ko; Yamakawa, Susumu; and Nakamura, Yasushi, 4,464,786, Cl. 382-7.000.
Ohzeki, Takashi: *See*—
Sekiya, Kunihiko; Mizuguchi, Mamoru; and Ohzeki, Takashi, 4,464,669, Cl. 346-76.0PH.
Okabe, Nobuo: *See*—
Terui, Nobuhiko; and Okabe, Nobuo, 4,464,037, Cl. 354-400.000.
Okamura, Shigeru: *See*—
Nozaki, Mineo; Ozawa, Toshiaki; Asakura, Osamu; Kondo, Hiroatsu; and Okamura, Shigeru, 4,463,672, Cl. 101-93.090.
O'Keeffe, James R., to Prosnip Corporation. Offset snips. 4,463,497, Cl. 30-252.000.
Okui, Isamu: *See*—
Yoshihisa, Kozo; and Okui, Isamu, 4,464,632, Cl. 330-254.000.
Okura, Zemichi; and Kohmoto, Shinsuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera with diaphragm adjustment control. 4,464,040, Cl. 354-455.000.
Okuyama, Teiji: *See*—
Kazaoka, Kenichi; Okuyama, Teiji; and Nishikawa, Masumi, 4,463,626, Cl. 74-493.000.
Okuyama, Yukio, to Aoki Kabushiki Kaisha. Compact rotary power cylinder. 4,463,662, Cl. 92-69.00R.
Oldham, Keith: *See*—
Yellin, Tobias O.; Gilman, David J.; Jones, Derrick F.; and Oldham, Keith, 4,464,374, Cl. 424-251.000.
O'Leary, Richard P., to Betz Entec, Inc. Indexing controller system and method of automatic control of cooling water tower systems. 4,464,315, Cl. 261-110.000.
Olson, John T., to Economics Laboratory. Injection pump. 4,464,098, Cl. 417-397.000.
Oltarzewski, Edward S.: *See*—
Munteanu, Marina A.; Cseko, Christine; Oltarzewski, Edward S.; Lindauer, Jerome I.; and Withycombe, Donald A., 4,464,271, Cl. 252-8.600.
Olympus Optical Co., Ltd.: *See*—
Kato, Kiichi; Sakamoto, Masaharu; Yoshikawa, Shoji; Yamamiya, Kunio; Kodama, Hiroshi; and Ohsima, Ken, 4,464,090, Cl. 356-237.000.
Kondo, Makoto, 4,464,694, Cl. 360-137.000.
Nakasho, Kazuo, 4,464,794, Cl. 455-157.000.
Saito, Shoichi; and Shirako, Hideo, 4,463,996, Cl. 312-9.000.

Omori, Kazuo; Tsuchiya, Hiroshi; Yamazaki, Yoshio; and Inowa, Shigeru, to Konishiroku Photo Industry Co., Ltd. Device for guiding a recording paper. 4,464,042, Cl. 355-3.0SH.

Omura, Takashi; Harada, Naoki; and Tezuka, Yasuo, to Sumitomo Chemical Company, Limited. Fiber reactive bisazo dye having both a vinylsulfone type reactive group and an ortho-nitrophenyl group. 4,464,297, Cl. 260-185.000.

Onishi, Shunichiro: *See*—
Hosokawa, Yasuhiko; and Onishi, Shunichiro, 4,464,711, Cl. 363-87.000.

Onley, John H. Method and apparatus for the removal of carbon monoxide from the exhaust discharges of small internal combustion engines. 4,464,349, Cl. 423-213.200.

Ono Pharmaceutical Co., Ltd.: *See*—
Sakai, Yoshiki; Imaki, Katsuhiro; and Muryobayashi, Takashi, 4,464,388, Cl. 424-275.000.
Tanouchi, Tadao; Kawamura, Masanori; Ajima, Akio; Mohri, Tetsuya; Hayashi, Masaki; Terashima, Hiroshi; Hirata, Fumio; and Morimura, Takeshi, 4,464,382, Cl. 424-270.000.

Ono, Tsuyoshi; and Ohno, Fumiaki, to Victor Company of Japan, Ltd. Separation band detecting circuit in an automatic program selection record player. 4,464,740, Cl. 369-41.000.

Ootsuka, Fumio: *See*—
Yoshimi, Akiro; Kuwajima, Takeshi; Ootsuka, Fumio; and Matsushima, Takeo, 4,463,801, Cl. 165-43.000.

Orii, Masaru. Vacuum suction apparatus. 4,463,980, Cl. 294-64.00R.

Oritani, Atsushi, to Fujitsu Limited. Trigger pulse generator. 4,464,581, Cl. 307-265.000.

Orogil: *See*—
Le Coent, Jean-Louis; and Demoures, Bernard, 4,464,289, Cl. 252-33.400.

Orser, Cindy S.; Lindow, Steven E.; Panopoulos, Nickolas J.; and Staskawicz, Brian J., to University of California, The Regents of the. Ice nucleating microorganisms. 4,464,473, Cl. 435-172.300.

Ortlepp, Hilmar: *See*—
Becker, Manfred; and Ortlepp, Hilmar, 4,463,819, Cl. 180-132.000.

Osaka Kagaku Gokin Kabushiki Kaisha: *See*—
Sato, Eiichi, 4,463,641, Cl. 83-175.000.

Osaka University: *See*—
Masubuchi, Masami, 4,464,578, Cl. 290-42.000.

Osterwalder, Johann M., to General Dynamics/Electronics Division. Broadband optical spectrum analyzer. 4,464,624, Cl. 324-77.00K.

Ostlinning, Edgar; and Idel, Karsten, to Bayer Aktiengesellschaft. Process for the production of high molecular weight, optionally branched, polyarylene sulphides. 4,464,507, Cl. 524-710.000.

Ota, Akiho: *See*—
Yoshino, Yataro; Ota, Akiho; and Sugiura, Hiroaki, 4,464,328, Cl. 264-521.000.

Ota, Yozo: *See*—
Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,464,311, Cl. 261-44.00C.

Otsuka Kagaku Yakuhin Kabushiki Kaisha: *See*—
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Shiroi, Takashi; Sasaoka, Michio; and Saito, Norio, 4,464,237, Cl. 204-81.000.

Ottenhues, Ludger, to Windmoller & Holscher. Doctor device. 4,463,675, Cl. 101-157.000.

Ouellette, Charles W.; and Edson, David; D., to Raytheon Company. Multiple depth selector mechanism. 4,464,130, Cl. 441-25.000.

Outokumpu Oy: *See*—
Tuovinen, Frans H.; Norrman, Bengt F.; Heikkila, Risto M.; and Hookaniemi, Matti E., 4,464,764, Cl. 373-87.000.

Ovodenko, Maxim B.: *See*—
Korshunov, Evgeny A.; Kuznetsov, Alexandr N.; Ovodenko, Maxim B.; Kuzmin, Gennady G.; Kostrov, Valery P.; Timofeev, Alexandr N.; Bastrikov, Valery L.; and Meschaninova, Tatyana V., 4,463,796, Cl. 164-460.000.

Owens, Roger W.; Hickey, Robert F.; and Capetanopoulos, Constantine, to Ecolotrol, Inc. Liquid flow distributor. 4,464,262, Cl. 210-291.000.

Owerko, John R., to A.R.F. Products, Inc. Portable transmitter enclosure. 4,464,792, Cl. 455-128.000.

Oya, Masayuki: *See*—
Iwao, Jun-ichi; Iso, Tadashi; and Oya, Masayuki, 4,464,371, Cl. 424-250.000.

Oyo Rubber Chemical Industry Co., Ltd.: *See*—
Kumasaka, Sadao; and Tada, Satomi, 4,463,951, Cl. 273-58.00A.

Ozaki, Kiyoshi: *See*—
Majima, Teiji; and Ozaki, Kiyoshi, 4,464,459, Cl. 430-313.000.

Ozawa, Kiyomi; Nakajima, Yasuyuki; Tsugeno, Makoto; Ishii, Shigeru; and Hatanaka, Masataka, to Nissan Chemical Industries, Ltd. Insecticidal 3-difluoromethoxyphenyl-1-phenylcarbamoyl-2-pyrazolines. 4,464,386, Cl. 424-273.00P.

Ozawa, Takeo: *See*—
Takahashi, Yoshio; Ozawa, Takeo; Sakamoto, Ryuji; Kanari, Katsuhiko; and Kaminoto, Masayuki, 4,463,799, Cl. 165-10.000.

Ozawa, Toshiaki: *See*—
Nozaki, Mineo; Ozawa, Toshiaki; Asakura, Osamu; Kondo, Hiroatsu; and Okamura, Shigeru, 4,463,672, Cl. 101-93.090.
Yamada, Yasuaki; Ozawa, Toshiaki; and Kondo, Hiroatsu, 4,464,069, Cl. 400-83.000.

Ozen: *See*—
Hager, Daniel, 4,464,324, Cl. 264-221.000.

Ozey, Erhan: *See*—
Bouck, Larry S.; Ozey, Erhan; and Worsham, Richard E., 4,463,988, Cl. 299-2.000.

Paccar Inc.: *See*—
Wilt, Donald A., 4,464,006, Cl. 339-126.00R.

Pace, Marshall O.; Adcock, James L.; and Christophorou, Loucas G., to United States of America, Energy. Method for minimizing contaminant particle effects in gas-insulated electrical apparatus. 4,464,417, Cl. 427-41.000.

Pacific Scientific Company: *See*—
Karras, Philip; and Ladson, Jack A., 4,464,054, Cl. 356-406.000.

Package Machinery Company: *See*—
Groenawalt, Eddie L.; Ray, Steve C.; and Garner, Daniels S., 4,463,542, Cl. 53-479.000.

Packaging Corporation of America: *See*—
Stone, James L., 4,463,852, Cl. 206-427.000.

Packaging Industries, Inc.: *See*—
D'Luzansky, John S., 4,464,064, Cl. 374-101.000.

Pai nee Hazkoto, Gizella: *See*—
Kocsis, Jozsef K.; Kiss, Laszlo ; Balajthy, Zoltan; Nagy, Peter; Pai nee Hazkoto, Gizella; Zarubai, Miklos; Sipos, Geza; Romhanyi, Andras; and Kokai, Rudolf, 4,464,504, Cl. 524-443.000.

Paige, William P.: *See*—
Thomas, Lowell S.; and Paige, William P., 4,464,487, Cl. 521-90.000.

Pairon, Guy S., to S.A. Cimenteries C.B.R. Cementbedrijven N.V. Process for producing cement and cement obtained by means of this process. 4,464,201, Cl. 106-90.000.

Palagi, Harvey N.: *See*—
Collura, Peter C.; Goda, Boyd D.; and Palagi, Harvey N., 4,464,155, Cl. 493-137.000.

Palamidis, Nickolas: *See*—
Herzing, Anthony G.; and Palamidis, Nickolas, 4,464,411, Cl. 426-613.000.

Palmer, Patrick V.: *See*—
Mansion, Geoffrey; and Palmer, Patrick V., 4,464,198, Cl. 75-130.00R.

Panak, Edouard: *See*—
Blanchard, Jean; and Panak, Edouard, 4,464,377, Cl. 424-256.000.

Panamerican Closures, Inc.: *See*—
Hammett, Roy, 4,463,882, Cl. 222-543.000.

Pann, Keh, to Mobil Oil Corporation. Method for migration of seismic reflection waves. 4,464,737, Cl. 367-49.000.

Panopoulos, Nickolas J.: *See*—
Orser, Cindy S.; Lindow, Steven E.; Panopoulos, Nickolas J.; and Staskawicz, Brian J., 4,464,473, Cl. 435-172.300.

Panse, Jane E.: *See*—
Panse, Richard G.; and Panse, Jane E., 4,463,954, Cl. 273-424.000.

Panse, Richard G.; and Panse, Jane E. Aquatic device. 4,463,954, Cl. 273-424.000.

Papadopoulo, Dora: *See*—
Bisagni, Emile; Dubertret, Louis; Moron, Jacqueline; Averbeck, Dietrich; Papadopoulo, Dora; Blais, Jocelyne; Vigny, Paul; Schwencke, Maria N.; Moustacchi, Ethel; Nocentini, Silvano; and Zajdela, Francois, 4,464,354, Cl. 424-59.000.

Papageorge, Stephen J.: *See*—
Rooney, Jack F.; Cooper, William K.; Papageorge, Stephen J.; and Christ, Eugene L., 4,463,804, Cl. 166-165.000.

Papp, Julius F. Egg separator. 4,463,666, Cl. 99-497.000.

Paradyne Corporation: *See*—
Bremer, Gordon, 4,464,767, Cl. 375-67.000.

Parent, Christopher A.: *See*—
Bullis, Robert H.; DiDomenico, Robert A.; Kimberley, John A.; McHugh, Thomas M.; Parent, Christopher A.; Voss, James R.; and Wiegand, Walter J., 4,463,729, Cl. 123-478.000.

Parke, W. Rod. Tool having locking device for rotatable head. 4,463,632, Cl. 81-177.900.

Parker, Dawood, to G. D. Searle & Co. Apparatus for monitoring the partial pressure of gases. 4,463,593, Cl. 73-19.000.

Parker, Elizabeth. Coupon secretary. 4,463,848, Cl. 206-214.000.

Parker, Frederick L.: *See*—
Barnes, Alan C.; Kay, David P.; Kennewell, Peter D.; Parker, Frederick L.; and Rowlands, David A., 4,464,373, Cl. 424-250.000.

Parker, John A.; and Koartides, Demetrius A., to United States of America, National Aeronautics and Space Administration. Fire blocking systems for aircraft seat cushions. 4,463,465, Cl. 5-459.000.

Parkes, Christopher W.; and Franklin, Robert C., to Beckman Instruments, Inc. Parabolic function generator. 4,464,727, Cl. 364-718.000.

Parlante, Henry J. Security Holster for revolver-pistol. 4,463,884, Cl. 224-243.000.

Parmer, Kenneth R., to AMP Incorporated. Pin terminal mounting system. 4,464,007, Cl. 339-220.00T.

Parmley, Richard J. Surgical drill apparatus. 4,464,113, Cl. 433-77.000.

Parr, Stephen R.; and Frost, Geoffrey M., to John & E. Sturge Limited. Stabilized lactase solutions and processes for stabilization. 4,464,469, Cl. 435-188.000.

Parry, William H.: *See*—
Barnes, Thomas J.; and Parry, William H., 4,463,654, Cl. 89-128.000.

Parslow, Michael W.; and Willis, Edwin, to Lever Brothers Company. Fabric softening composition. 4,464,272, Cl. 252-8.800.

Parslow, Michael W.; and Willis, Edwin, to Lever Brothers Company. Fabric softening composition. 4,464,273, Cl. 252-8.800.

Parsons, Margaret: *See*—
Fuller, Berkeley; Soll, Linda; Obrecht, Margretta; Poole, Gary; Campbell, Edward F., Jr.; Parsons, Margaret; Chun, Valerie P. P.; Shearer, David R.; and Cashman, Thomas M., 4,464,122, Cl. 434-262.000.

Parton, James. Fireplace insert. 4,463,747, Cl. 126-164.000.

Pasquale, William D., to New England Envelope Mfg. Co. Cover for rectangular trays. 4,463,895, Cl. 229-49.000.

Passafiume, Anthony: *See—*
Dickover, William E.; Klasek, Ladislav J.; and Passafiume, Anthony, 4,464,217, Cl. 156-164.000.

Patalong, Hubert, to Siemens Aktiengesellschaft. Semiconductor component. 4,464,673, Cl. 357-38.000.

Patel, Bhupendra P.: *See—*
Prusak, John J.; and Patel, Bhupendra P., 4,463,849, Cl. 206-307.000.

Patil, Arun A.; and Amundson, E., to Patil, Arun A. Computed tomography stereotactic frame. 4,463,758, Cl. 128-303.00B.

Patrick, Charles H., Jr. Process for the recovery of fatty acids from discarded solid soap materials. 4,464,305, Cl. 260-412.000.

Paul, Donald D.: *See—*
Chambers, J. Bruce; and Paul, Donald D., 4,464,092, Cl. 414-534.000.

Pauli, Louis F.: *See—*
Rappoldt, Menso P.; Pauli, Louis F.; and Hoogendoorn, Jan, 4,464,298, Cl. 260-239.55C.

Pawlowski, Thomas D., to James River-Dixie/Northern, Inc. Packaging. 4,464,552, Cl. 206-569.000.

Pazonyi, Tamas: *See—*
Czvikovszky, Tibor J.; Pazonyi, Tamas; Topolcai, Laszlone I.; and Kleban, Janos, 4,464,510, Cl. 525-54.230.

Peace, Paul W. Beverage warming apparatus. 4,463,664, Cl. 99-323.300.

Pearce, Richard H. Airplane tow bar and step stool combination. 4,463,826, Cl. 182-20.000.

Pearce, Ronald A.: *See—*
Huffman, Stanley S.; Dorfman, Jan L.; Frenkel, Robert L.; and Pearce, Ronald A., 4,463,844, Cl. 194-4.00C.

Pecha, Edward: *See—*
Heller, Martin G.; Pecha, Edward; Smith, Douglas; and Rudder, Joel, 4,463,636, Cl. 83-13.000.

Pechanek, Gerald G.: *See—*
Hanft, Roy F.; and Pechanek, Gerald G., 4,464,070, Cl. 400-98.000.

Pecker, Calman: *See—*
Lynch, Joseph M.; Pfafflin, James R.; Pecker, Calman; Cardenas, Raul; Cunningham, Seamus; Bozzone, Richard T., Sr.; and Borg, Sidney, 4,464,257, Cl. 210-195.100.

Pederson, Lester A.: *See—*
Hiraoka, Hiroyuki; Hofer, Donald C.; Miller, Robert D.; Pederson, Lester A.; and Willson, Carlton G., 4,464,460, Cl. 430-323.000.

Peil, William; Brown, Thomas A.; and Harris, James E., to General Electric Company. Lighting unit. 4,464,607, Cl. 315-209.00R.

Pensec, Thierry: *See—*
Sturtz, Georges; Pensec, Thierry; and Gautier, Jean-Claude, 4,464,346, Cl. 423-10.000.

Penzien, Klaus: *See—*
Naarmann, Herbert; Penzien, Klaus; Muench, Volker; and Franz, Klaus-Dieter, 4,464,511, Cl. 525-61.000.

Perelli, Layne P. Device for measuring fatigue effects. 4,464,121, Cl. 434-236.000.

Performance Industries, Inc.: *See—*
Boyesen, Eyvind, 4,463,824, Cl. 180-227.000.

Perkin-Elmer Corporation, The: *See—*
Talmadge, Paul C.; and Vergato, Joseph A., 4,464,051, Cl. 356-323.000.

Perr, Julius P.; and Peters, Lester L., to Cummins Engine Company, Inc. Unit fuel injector having independently controlled timing and metering. 4,463,901, Cl. 239-95.000.

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Simpson, Anthony; Peterkin, Stuart M.; and Brooksby, Brian T., 4,464,115, Cl. 434-27.000.

Peters, Lester L.: *See—*
Perr, Julius P.; and Peters, Lester L., 4,463,901, Cl. 239-95.000.

Peterson, Bruce W.: *See—*
Zimmerman, Robert L.; and Peterson, Bruce W., 4,464,488, Cl. 521-115.000.

Peterson, Michael: *See—*
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 4,463,644, Cl. 83-745.000.

Petr, Jan: *See—*
Lienhard, Heinz; Petr, Jan; and Steinle, Benedikt, 4,464,625, Cl. 324-117.00R.

Petzoldt, Karl: *See—*
Hofmeister, Helmut; Petzoldt, Karl; Annen, Klaus; Laurent, Henry; Wiechert, Rudolf; and Nishino, Yukeshige, 4,464,365, Cl. 424-243.000.

Pfafflin, James R.: *See—*
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Pfizer Inc.: *See—*
Bright, Gene M., 4,464,527, Cl. 536-7.400.
Hutchison, Alan J., 4,464,380, Cl. 424-263.000.

Phillips Petroleum Company: *See—*
Kukes, Semyon G.; Harris, Jesse R.; and Banks, Robert L., 4,464,251, Cl. 208-221.000.

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Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Hudson, Wilbur G.; Webb, Tommy W.; Phillips, William S.; Tompa, Thomas J.; and Sanders, Edward, Jr., 4,463,669, Cl. 100-43.000.

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Pierburg GmbH & Co., KG.: *See—*
Sudbeck, Rainer; and Baumgartner, Hans, 4,463,554, Cl. 60-274.000.

Pierce, Aaron E.; and Rickey, Wynn P., to Exxon Production Research Co. Apparatus for sealing a pipeline. 4,463,597, Cl. 73-40.50R.

Pierick, Richard L. Method for preparing pizza in a baking oven. 4,464,406, Cl. 426-496.000.

Pikorz, Wolfgang; Scheuermann, Hans; and Sonntag, Alois, to Licentia Patent-Verwaltungs-GmbH. Molybdenum coated with a noble metal. 4,464,441, Cl. 428-579.000.

Pilley, H. Robert, to Warner Lambert Technologies, Inc. Circuit for controlling optical apparatus such as an ophthalmoscope. 4,464,608, Cl. 315-241.00P.

Pischinger, Franz; and Havenith, Cornelis, to Pischinger, Franz. Air-compressing, self-igniting engine for liquid fuel. 4,463,719, Cl. 123-276.000.

Pitel, Ira J., to Cornell-Dubilier Corp. Modular lighting control with circulating inductor. 4,464,610, Cl. 315-291.000.

Pitt, Garry E.: *See—*
Groudan, Alan I.; Pitt, Garry E.; and Barnes, Lell E., 4,464,747, Cl. 371-50.000.
Schroeder, George F.; Pitt, Garry E.; Scully, John F.; and Barnes, Lell E., 4,464,752, Cl. 371-38.000.

Pittalis, Francesco; Bartoli, Francesco; and Giovannoni, Guido, to Anic S.p.A. Process for the preparation of chitosan fibers. 4,464,321, Cl. 264-83.000.

Pittet, Alan O.; Vock, Manfred H.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, to International Flavors & Fragrances Inc. Uses of methyl substituted 2-(2,6-dimethyl-1,5-heptadienyl)-1,3-dithiolanes in augmenting or enhancing the aroma or taste of foodstuffs. 4,464,408, Cl. 426-535.000.

Plante, Joseph L. P.; Kluchert, Rolf E.; and St-Onge, Joseph C. M., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Water ballast compartment for buoyant marine devices. 4,464,131, Cl. 441-29.000.

Plastomer Corporation: *See—*
Baughman, Walter P., 4,463,931, Cl. 251-298.000.

Plies, Erich, to Siemens Aktiengesellschaft. Opposing field spectrometer for electron beam mensuration technology. 4,464,571, Cl. 250-305.000.

PLM Aktiebolag: *See—*
Jakobsen, Kjell M.; and Nilsson, Claes T., 4,464,106, Cl. 425-525.000.

Plourde, Gerard. Liquid settling and recycling machine. 4,464,256, Cl. 210-149.000.

Pluequet, Heinz, to Klockner-Humboldt-Deutz Aktiengesellschaft. Exhaust gas conduit system for multi-cylinder reciprocating piston internal combustion engines. 4,463,709, Cl. 123-41.500.

Plum, Helmut, to Hoechst Aktiengesellschaft. Polymers with primary amino groups their preparation and their use. 4,464,522, Cl. 526-301.000.

Pneumo Corporation: *See—*
Tootle, James N.; and Martin, Eugene J., 4,463,657, Cl. 91-44.000.
Tootle, James N., 4,463,661, Cl. 92-17.000.

Pochon, Remy: *See—*
Polzer, Erich; Ruetz, Gottfried; Schmolz, Herbert; and Pochon, Remy, 4,463,556, Cl. 60-330.000.

Pogson, John T.; Shannon, Roger L.; Hamasaki, Robert H.; Franklin, James L.; Watkins, Dale F.; and Kramer, Ted J., to Boeing Company, The. Electrostatically pumped heat pipe and method. 4,463,798, Cl. 165-1.000.

Pohl, Ludwig: *See—*
Hasegawa, Shinji; Toriyama, Kazuhisa; Pohl, Ludwig; and Weber, Georg, 4,464,283, Cl. 252-299.630.

Polis, Marjorie J.; and Mikhail, Joanne E., to Westinghouse Electric Corp. Elevator system. 4,463,834, Cl. 187-29.00R.

Pollard, John K., Jr., to American Hoechst Corporation. Material and method for removing immunoglobulins from whole blood. 4,464,165, Cl. 604-5.000.

Pols, Sidney; and Schultz, Eugene L. Orthopedic shoe. 4,463,761, Cl. 128-581.000.

Polysar Limited: *See—*
Rempel, Gary L.; and Azizian, Hormoz, 4,464,515, Cl. 525-338.000.

Polzer, Erich; Ruetz, Gottfried; Schmolz, Herbert; and Pochon, Remy, to Voith Getriebe KG. Hydrodynamic starting torque converter. 4,463,556, Cl. 60-330.000.

Pommer, Ernst-Heinrich: *See—*
Gramlich, Walter; Himmele, Walter; Martin, Christoph; Pommer, Ernst-Heinrich; and Siegel, Hardo, 4,464,370, Cl. 424-248.400.
Janssen, Bernd; Meyer, Norbert; Pommer, Ernst-Heinrich; and Ammermann, Eberhard, 4,464,381, Cl. 424-269.000.

Pons, Robert L.: *See—*
Sobczak, Isidore F.; Cleveland, William C., Jr.; and Pons, Robert L., 4,463,749, Cl. 126-451.000.

Poole, Gary: *See—*
Fuller, Berkeley; Soll, Linda; Obrecht, Margretta; Poole, Gary; Campbell, Edward F., Jr.; Parsons, Margaret; Chun, Valerie P. P.; Shearer, David R.; and Cashman, Thomas M., 4,464,122, Cl. 434-262.000.

Poppert, Paul E.: *See*—
Goldman, Ernest A.; McCarthy, Jeremiah P.; and Poppert, Paul E., 4,463,491, Cl. 29-571.000.

Porex Technologies, Corp.: *See*—
Dojki, Kassim H. V. M.; and Haldopoulos, Iaokim, 4,464,254, Cl. 210-136.000.

Porter, Ned A.; Ziegler, Carl B., Jr.; and Roberts, David H., to Duke University. Vinyl Cyclopropyl compounds as precursors to fatty acid oxidation products. 4,464,304, Cl. 260-410.000.

Potrykus, Franz. Foil sliding bearing in particular for pumps used in chemical processes. 4,464,068, Cl. 384-103.000.

Poush, Kenneth A.: *See*—
Caldwell, Donald L.; and Poush, Kenneth A., 4,464,238, Cl. 204-98.000.

Powell, Hampton O.: *See*—
Bost, Gretchen L.; and Powell, Hampton O., 4,463,464, Cl. 5-459.000.

PPG Industries, Inc.: *See*—
Krass, Dennis K.; and Richter, Sidney B., 4,464,533, Cl. 544-354.000.
Vance, Jeffrey D., 4,464,525, Cl. 528-9.000.

Pratley, Gerald: *See*—
Boden, John C.; and Pratley, Gerald, 4,464,110, Cl. 431-350.000.

Precision Connector Designs, Inc.: *See*—
Dwight, John L., 4,464,005, Cl. 339-112.00R.

Precision Interlock Log Homes, Inc.: *See*—
Faw, Garland, 4,463,532, Cl. 52-233.000.

Premel, Ulrich, to L. & C. Steinmuller GmbH. Apparatus for removal of ash and slag. 4,463,686, Cl. 110-165.00R.

Prentice, John S., to Harris Corporation. Circuit for trimming FET differential pair offset voltage without increasing the offset voltage temperature coefficient. 4,464,631, Cl. 330-253.000.

Prewo, Karl M.: *See*—
Layden, George K.; and Prewo, Karl M., 4,464,192, Cl. 65-18.100.

Price, Charles A.: *See*—
Cera, Thomas J.; and Price, Charles A., 4,464,184, Cl. 55-21.000.

Prigent, Hubert; Roudeau, Maurice; and Daniel, Michel. Test device for and method of locating faults in a two-wire line or for switching two-wire lines. 4,464,621, Cl. 324-52.000.

Prisbylla, Michael P., to Stauffer Chemical Company. Mixed alkylsulfonium salts of N-phosphonomethylglycine. 4,464,194, Cl. 71-87.000.

Process Research Development & Management, Inc.: *See*—
Lynch, Joseph M.; Pfafflin, James R.; Pecker, Calman; Cardenas, Raul; Cunningham, Seamus; Bozzone, Richard T., Sr.; and Borg, Sidney, 4,464,257, Cl. 210-195.100.

Propst, Franklin M., to Education & Informations Systems, Inc. Random access read/write unit. 4,464,689, Cl. 360-78.000.

Prosnip Corporation: *See*—
O'Keeffe, James R., 4,463,497, Cl. 30-252.000.

Prusak, John J.; and Patel, Bhupendra P., to RCA Corporation. Video disc caddy. 4,463,849, Cl. 206-307.000.

PT Components, Inc.: *See*—
Avramidis, Stellios A., 4,463,550, Cl. 59-84.000.

Public Service Electric and Gas Company: *See*—
Garbarini, Philip P.; and Noe, Renato R., 4,463,871, Cl. 220-378.000.

Pulman, David A.: *See*—
Elliott, Michael; Janes, Norman F.; and Pulman, David A., 4,464,391, Cl. 424-304.000.

Puryear, John W., to Brunswick Corporation. Dual mounted bearings for fishing reel. 4,463,914, Cl. 242-84.10J.

Puryear, John W., to Brunswick Corporation. Silent and selective anti-reverse mechanism. 4,463,916, Cl. 242-84.20A.

Pusch, Gunter; and Hoffmann, Alexander. Method and apparatus for protecting vehicles against reconnaissance by IR-IMAGING equipment. 4,463,653, Cl. 89-14.100.

Pusch, Gunther; Aisslinger, Dieter E.; Hoffmann, Alexander; and Pusch, Klaus-Werner. Heat reflecting wall paper or wall covering. 4,464,418, Cl. 427-44.000.

Pusch, Klaus-Werner: *See*—
Pusch, Gunther; Aisslinger, Dieter E.; Hoffmann, Alexander; and Pusch, Klaus-Werner, 4,464,418, Cl. 427-44.000.

Pylon Electronic Development Co., Ltd.: *See*—
Vandrish, George, 4,464,574, Cl. 250-432.0PD.

Pyreflex Corp.: *See*—
Berg, Charles A., 4,463,797, Cl. 164-492.000.

Quarella, Guido, to Hauni-Werke Korber & Co. KG. Apparatus for forming a tobacco filler. 4,463,768, Cl. 131-84.00B.

R & H Technology Inc.: *See*—
Heine, Otto R., 4,463,992, Cl. 308-6.00C.

Raff, Lothar; and Wiedenmann, Hans-Martin, to Robert Bosch GmbH. Wide-range temperature operating system for combustion gas oxygen sensor, and method. 4,463,594, Cl. 73-23.000.

Raggi, Lodovico, to Associated Engineering Italy S.p.A. Method of manufacturing piston rings. 4,463,487, Cl. 29-156.630.

Rahman, Matiur: *See*—
Judd, Henry E.; Dowell, Arthur M., Jr.; and Rahman, Matiur, 4,463,778, Cl. 138-118.100.

Rampf, Herbert, to Linde Aktiengesellschaft. Welding-wire feed monitor. 4,463,500, Cl. 33-129.000.

Ramser, Robert A.; Booz, A. Daivd; Barch, Daniel R.; and Cebulak, Walter S., to Aluminum Company of America. Apparaus for the production of atomized metal particles. 4,464,103, Cl. 425-7.000.

Rapisarda, Anthony; Camps, Edilia; and Bauer, Herbert, to Lever Brothers Company. Stabilized bleach-sensitive dyes in automatic dishwasher detergent compositions. 4,464,281, Cl. 252-174.210.

Rapp, A. Karl, to National Semiconductor Corporation. Memory system current sense amplifier circuit. 4,464,590, Cl. 307-530.000.

Rapp, A. Karl, to National Semiconductor Corporation. Current difference sense amplifier. 4,464,591, Cl. 307-530.000.

Rappoldt, Menso P.; Pauli, Louis F.; and Hoogendoorn, Jan, to Duphar International Research B.V. Method of preparing Δ5,7-steroids. 4,464,298, Cl. 260-239.55C.

Rasiyah, Nagendra P.: *See*—
Tseung, Alfred C. C.; Rasiyah, Nagendra P.; and Hibbert, David B., 4,464,239, Cl. 204-129.000.

Rask, Rodney B., to General Motors Corporation. Method and apparatus for measuring mass airflow. 4,463,601, Cl. 73-118.000.

Raskin, Donald: *See*—
Anderson, Philip M., III; Raskin, Donald; and Reich, Ronald K., 4,463,610, Cl. 73-654.000.

Rastetter, Adolf; and Schmalenbach, Erich, to Sitema, Gesellschaft fur Sicherheitstechnik and Maschinenbau mbH. Clamping device. 4,463,481, Cl. 188-67.000.

Rastogi, Laxmi K.; and Sussman, Scot W., to Measurex Corporation. System and process for controlling a calciner. 4,464,111, Cl. 432-24.000.

Ray, Steve C.: *See*—
Greenawalt, Eddie L.; Ray, Steve C.; and Garner, Daniels S., 4,463,542, Cl. 53-479.000.

Raychem Corporation: *See*—
Reeder, Larry R., 4,464,540, Cl. 174-35.00C.

Raynes, Edward P.: *See*—
Harrison, Kenneth J.; Raynes, Edward P.; Saunders, Frances C.; and Thompson, David J., 4,464,282, Cl. 252-299.100.

Raytheon Company: *See*—
Ouellette, Charles W.; and Edson, David; D., 4,464,130, Cl. 441-25.000.

RCA Corporation: *See*—
Balaban, Alvin R.; and Steckler, Steven A., 4,464,675, Cl. 358-31.000.
Bloom, Stanley, 4,464,601, Cl. 313-403.000.
Brauer, Eric A., 4,464,742, Cl. 369-71.000.
Chartier, Michael S., 4,464,723, Cl. 364-571.000.
Crowley, Albert T.; and Lisowski, Robert M., 4,464,638, Cl. 331-1.00A.
Gale, Michael T.; and Knop, Karl H., 4,464,030, Cl. 354-4.000.
Gorog, Istvan, 4,463,850, Cl. 206-309.000.
Harwood, Leopold A.; and Shanley, Robert L., II, 4,464,633, Cl. 330-254.000.
Hasili, Jacob P., 4,464,611, Cl. 315-366.000.
Helm, James H., 4,464,744, Cl. 369-264.000.
Krufka, Frank S., 4,464,556, Cl. 219-113.000.
Prusak, John J.; and Patel, Bhupendra P., 4,463,849, Cl. 206-307.000.
Reitmeier, Glenn A., 4,464,686, Cl. 358-314.000.
Scheible, Howard G.; and Berkshire, Jon B., 4,463,891, Cl. 228-180.00R.
Schiff, Leonard N.; and Freeman, Smith, 4,464,678, Cl. 358-122.000.
Stewart, Roger G.; and Dingwall, Andrew G. F., 4,464,754, Cl. 371-51.000.
Stewart, Roger G.; and Dingwall, Andrew G. F., 4,464,755, Cl. 371-51.000.
Thompson, Charles R., 4,464,683, Cl. 358-310.000.
Wargo, Robert A., 4,464,679, Cl. 358-148.000.

Reavis, Robert P.; Mayberry, Mickey L.; Willette, David; Weisenburger, Lawrence P.; and Bates, Reginald A., to AMP Incorporated. Connector assembly for undercarpet cable. 4,463,998, Cl. 339-40.000.

Redmond, Russell J.; and Hannula, Donald L., to American Hospital Supply Corporation. Low profile shunt system. 4,464,168, Cl. 604-9.000.

Redmond, William G., to LTV Aerospace and Defense Company, The. System monitor circuit having first and second phase-sensitive demodulator circuits coupled to first and second loads, and a comparator section for monitoring the loads. 4,464,661, Cl. 340-960.000.

Redzinski, Gilbert E., to Clark Equipment Company. Lockup control system for torque converter. 4,463,842, Cl. 192-0.052.

Reed, Geoffrey R.: *See*—
Laws, William R.; and Reed, Geoffrey R., 4,463,585, Cl. 72-10.000.

Reeder, Larry R., to Raychem Corporation. Shield termination enclosure with access means and shield connection device. 4,464,540, Cl. 174-35.00C.

Rees, Richard W. A., to General Motors Corporation. Seat slide structure. 4,463,922, Cl. 248-429.000.

Reich, Ronald K.: *See*—
Anderson, Philip M., III; Raskin, Donald; and Reich, Ronald K., 4,463,610, Cl. 73-654.000.

Reich, Ronald S.; Held, Jimmy L.; Munson, Arthur E.; and Hartley, James R., to United States of America, Navy. Deep submergence vehicle (DSV) lightweight cable cutter. 4,463,496, Cl. 30-180.000.

Reichen, Ronald L.: *See*—
Hubbard, Arthur L.; Copley, Russell D.; and Reichen, Ronald L., 4,463,543, Cl. 56-44.000.

Reifenhauser GmbH & Co. Maschinenfabrik: *See*—
Halter, Hartmut; and Schnell, Willi, 4,464,319, Cl. 264-40.100.

Reiker, Kenneth H. Hanger assembly. 4,463,923, Cl. 248-546.000.

Reilly, Charles; Laub, Leonard; and Swaminathan, Krishna, to Storage Technology Corporation. Photoelectric information and focus detector. 4,464,567, Cl. 250-204.000.

Reinfelder, Heinz: *See*—
Finkenzeller, Johann; Schmidt, Wilfried; and Reinfelder, Heinz, 4,464,779, Cl. 378-176.000.
Reinke Manufacturing Co., Inc.: *See*—
Reinke, Richard F.; and Coash, Ronald J., 4,463,906, Cl. 239-720.000.
Reinke, Richard F.; and Coash, Ronald J., to Reinke Manufacturing Co., Inc. Guidance system for lateral move irrigation machines. 4,463,906, Cl. 239-720.000.
Reismann, Josef: *See*—
Brandis, Helmut; Spyra, Wolfgang; and Reismann, Josef, 4,464,335, Cl. 420-584.000.
Reitmeier, Glenn A., to RCA Corporation. Adaptive television signal estimator. 4,464,686, Cl. 358-314.000.
Remes, Wally A.: *See*—
Young, Hartley F.; and Remes, Wally A., 4,463,898, Cl. 238-310.000.
Rempel, Gary L.; and Azizian, Hormoz, to Polysar Limited. Polymer hydrogenation process. 4,464,515, Cl. 525-338.000.
Rensselaer Polytechnic Institute: *See*—
Zelman, Allen, 4,464,337, Cl. 422-41.000.
Repco Limited: *See*—
Molnar, Thomas G., 4,463,984, Cl. 297-250.000.
Research Corporation: *See*—
Suhadolnik, Robert J.; Wu, Joseph M.; Doetsch, Paul; and Henderson, Earl E., 4,464,359, Cl. 424-180.000.
Rexnord Inc.: *See*—
Kahl, James D., 4,464,151, Cl. 474-231.000.
Reycan Research Limited: *See*—
Griffin, Alan O., 4,463,586, Cl. 72-17.000.
Rheinische Braunkohlenwerke AG: *See*—
Hermann, Wolfgang; Ruter, Bernhard; Gorris, Rainer; and Nowak, Herbert, 4,463,690, Cl. 110-336.000.
Ritter, Gunter; Lenz, Uwe; and Lazik, Paul, 4,464,479, Cl. 502-185.000.
Richardson-Vicks, Inc.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,464,376, Cl. 424-253.000.
Richter, Eike: *See*—
Miller, Timothy J. E.; Jones, Donald W.; Richter, Eike; and Kalan, Gary L., 4,464,596, Cl. 310-156.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Kreidl, Janos; Nemes, Andras; Farkas nee Kirjak, Maria; Visky, Gyorgy; and Czibula, Laszlo , 4,464,534, Cl. 546-51.000.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Kreidl, Janos; Visky, Gyorgy; Nemes, Andras; Czibula, Laszlo ; and Farkas nee Kirjak, Maria, 4,464,535, Cl. 546-51.000.
Richter, Sidney B.: *See*—
Krass, Dennis K.; and Richter, Sidney B., 4,464,533, Cl. 544-354.000.
Rickenbach, Jakob: *See*—
Dreier, Ernst; and Rickenbach, Jakob, 4,463,693, Cl. 112-128.000.
Rickey, Wynn P.: *See*—
Pierce, Aaron E.; and Rickey, Wynn P., 4,463,597, Cl. 73-40.50R.
Ricoh Company, Ltd.: *See*—
Komai, Hiromichi; and Ameyama, Minoru, 4,464,668, Cl. 346-75.000.
Ricoh Watch Co., Ltd.: *See*—
Kamiya, Kenji, 4,464,061, Cl. 368-202.000.
Rieter Machine Works, Ltd.: *See*—
Oehy, Peter; and Schmid, Rene, 4,463,480, Cl. 19-159.00A.
Riker Laboratories, Inc.: *See*—
Scherrer, Robert A.; and Moore, George G. I., 4,464,536, Cl. 546-213.000.
Risbud, Subhash H.; and Sekhar, Jainagesh A. Crystal growth in glasses and amorphous semiconductors. 4,464,557, Cl. 219-121.0LM.
Riseman, Jacob: *See*—
Bhatia, Harsaran S.; and Riseman, Jacob, 4,464,212, Cl. 148-187.000.
Ritter, Ernst, to Robert Bosch GmbH. Centrifugal rpm governor for fuel injected internal combustion engines. 4,463,720, Cl. 123-364.000.
Ritter, Gunter; Lenz, Uwe; and Lazik, Paul, to Rheinische Braunkohlenwerke AG. Method for treating red mud. 4,464,479, Cl. 502-185.000.
RIV-SKF Officine di Villar Perosa S.p.A.: *See*—
Barale, Danilo, 4,463,713, Cl. 123-90.550.
Rivers, Robert. Joint locking mechanism. 4,463,475, Cl. 16-241.000.
Rivers, Ronald D.: *See*—
Kumar, Prabhat; Rivers, Ronald D.; and Hickl, Anthony J., 4,464,205, Cl. 148-11.50P.
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Roach, Maurice P., to Deere & Company. Basket for retaining parts during heat treatment. 4,463,864, Cl. 220-4.00F.
Robbins, Norman M.: *See*—
Barnes, James E.; Morkoetter, James G.; and Robbins, Norman M., 4,463,631, Cl. 81-3.10R.
Robeet Bosch GmbH: *See*—
Zorn, Guenter, 4,463,471, Cl. 15-250.190.
Robert Bosch GmbH: *See*—
Babitzka, Rudolf; Beck, Walter; and Schlagmuller, Walter, 4,463,727, Cl. 123-458.000.
Brammer, Hartmut, 4,463,715, Cl. 123-146.50A.
Burger, Kurt; Friedrich, Heinz; Gruner, Heiko; Linn, Karl-Otto; and Zabler, Erich, 4,464,646, Cl. 338-25.000.
Heiser, Joachim; and Kobald, Walter, 4,463,658, Cl. 91-388.000.
Kofink, Wolfgang, 4,464,593, Cl. 310-58.000.
Laufer, Helmut; and Kuschmierz, Heinz, 4,463,725, Cl. 123-446.000.
Leiber, Heinz, 4,463,561, Cl. 60-547.100.
Raff, Lothar; and Wiedenmann, Hans-Martin, 4,463,594, Cl. 73-23.000.
Ritter, Ernst, 4,463,720, Cl. 123-364.000.
Schulz, Axel; and Staude, Werner, 4,464,674, Cl. 358-21.00R.
Roberts, David H.: *See*—
Porter, Ned A.; Ziegler, Carl B., Jr.; and Roberts, David H., 4,464,304, Cl. 260-410.000.
Roberts, Stanley; and Ryan, James G., to International Business Machines Corporation. Process for making high dielectric constant nitride based materials and devices using the same. 4,464,701, Cl. 361-313.000.
Robot Crabtor International: *See*—
Falamak, Reza, 4,463,821, Cl. 180-168.000.
Roca-Nierga, Manuel; and Forapisanti, Mauro, to Spica S.p.A. Distributor pump for injecting fuel into internal combustion engines. 4,463,726, Cl. 123-449.000.
Rockwell International Corporation: *See*—
Brissette, Ronald N.; and Kumbier, Richard L., 4,463,993, Cl. 308-184.00R.
Henning, Jerrold V., 4,464,586, Cl. 307-271.000.
Staples, Edward J., 4,464,639, Cl. 333-154.000.
Rodi, Anton, to Heidelberger Druckmaschinen AG. Device for controlling a plurality of servomotors on printing machines. 4,464,615, Cl. 318-625.000.
Rodriquez, Daniel V.; and Daniels, Roger S., to Integrated Ceilings, Inc. Clip for suspending ceiling panels. 4,463,537, Cl. 52-489.000.
Roensch, L. Fred, to Nalco Chemical Company. Energy conservation within the Kellogg ammonia process. 4,464,228, Cl. 203-49.000.
Rogers Corporation: *See*—
Kosa, Bruce G., 4,464,491, Cl. 521-134.000.
Roggo, Bernard: *See*—
Chielens, Alain; Benoit, Philippe; and Roggo, Bernard, 4,463,795, Cl. 164-455.000.
Rollins Environmental Services, Inc.: *See*—
Hillier, Edward; Graybill, Larry; Winders, Richard; Bridge, Dan; and Dauchy, Joe, 4,464,081, Cl. 405-128.000.
Rolls-Royce Inc.: *See*—
Nightingale, Douglas J., 4,463,902, Cl. 239-265.170.
Rolls-Royce Limited: *See*—
Willis, Jeffrey D.; Griffin, Arthur B.; and Boyce, Bernard W., 4,463,568, Cl. 60-742.000.
Romero, Hugo; Arad, Avi; Nagel, Dietmar; and Kennedy, Melvin, to North American Foreign Trading Corporation. Electrical educational device. 4,464,124, Cl. 434-321.000.
Romhanyi, Andras: *See*—
Kocsis, Jozsef K.; Kiss, Laszlo ; Balajthy, Zoltan; Nagy, Peter; Pai nee Hazkoto, Gizella; Zarubai, Miklos; Sipos, Geza; Romhanyi, Andras; and Kokai, Rudolf, 4,464,504, Cl. 524-443.000.
Rooney, Jack F.; Cooper, William K.; Papageorge, Stephen J.; and Christ, Eugene L., to Texaco Inc. Vented non-pressurized, uncontaminated well fluid sampler. 4,463,804, Cl. 166-165.000.
Rosenberg, Burkard: *See*—
Bubik, Alfred; Kummer, Oskar; and Rosenberg, Burkard, 4,464,225, Cl. 162-181.600.
Rossini, Aldo A.: *See*—
Mordes, John P.; and Rossini, Aldo A., 4,464,356, Cl. 424-106.000.
Roth, Bernard: *See*—
Germain, Alfred; and Roth, Bernard, 4,463,771, Cl. 134-122.00R.
Rothfjell, Rolf E., to AB Rollfilm. Method of producing an identity document. 4,464,448, Cl. 430-22.000.
Rotondo, Claude P.: *See*—
Eliason, Robbin D.; and Rotondo, Claude P., 4,463,994, Cl. 308-196.000.
Roudeau, Maurice: *See*—
Prigent, Hubert; Roudeau, Maurice; and Daniel, Michel, 4,464,621, Cl. 324-52.000.
Rouet, Michel: *See*—
Bezer, Christian; and Rouet, Michel, 4,464,331, Cl. 376-202.000.
Roussel Uclaf: *See*—
Barnes, Alan C.; Kay, David P.; Kennewell, Peter D.; Parker, Frederick L.; and Rowlands, David A., 4,464,373, Cl. 424-250.000.
Nedelec, Lucien; and Torelli, Vesperto, 4,464,302, Cl. 260-397.100.
Rowbal, Robert M. Color match board game. 4,463,952, Cl. 273-236.000.
Rowe, Geoffrey W.: *See*—
Hobbs, Donald A.; and Rowe, Geoffrey W., 4,463,600, Cl. 73-81.000.
Rowland, Charles M.: *See*—
Denneny, James A., Jr.; and Rowland, Charles M., 4,463,897, Cl. 236-92.00R.
Rowlands, David A.: *See*—
Barnes, Alan C.; Kay, David P.; Kennewell, Peter D.; Parker, Frederick L.; and Rowlands, David A., 4,464,373, Cl. 424-250.000.
Rozensher, Zvi: *See*—
Garito, Jon C.; Ellman, Alan; and Rozensher, Zvi, 4,463,759, Cl. 128-303.140.
Rubber- en Kunststoffabriek ENBI B.V.: *See*—
Delhaes, Johannes C., 4,463,955, Cl. 277-1.000.

Rubens, Harry E., to Institute of Applied Biology Special Cancer Research Project. Apparatus for obtaining an objective determination of the rate of oxygen utilization in peripheral tissue. 4,463,762, Cl. 128-633.000.

Rudder, Joel: *See*—
Heller, Martin G.; Pecha, Edward; Smith, Douglas; and Rudder, Joel, 4,463,636, Cl. 83-13.000.

Rudolf, Peter: *See*—
Autzen, Horst; Motz, Herbert; Rudolf, Peter; Sarnecki, Wilhelm; Steck, Werner; and Vaeth, Guenter, 4,464,352, Cl. 423-634.000.

Rudolph, Kathleen, executrix: *See*—
Rudolph, Rome R., deceased; Rudolph, Kathleen, executrix; Strutz, Carl; and Strutz, Frank C., 4,463,671, Cl. 101-35.000.

Rudolph, Rome R., deceased; by Rudolph, Kathleen, executrix; Strutz, Carl; and Strutz, Frank C. Silk-screen printing method and apparatus. 4,463,671, Cl. 101-35.000.

Ruetz, Gottfried: *See*—
Polzer, Erich; Ruetz, Gottfried; Schmolz, Herbert; and Pochon, Remy, 4,463,556, Cl. 60-330.000.

Ruiz, Gilbert G. Pediatric restraint for X-ray photography. 4,464,780, Cl. 378-178.000.

Rupert, Robert E. System for converting oral music to instrumental music. 4,463,650, Cl. 84-1.190.

Rusch, William T., to Sanders Associates, Inc. High dynamic range multiplexing system. 4,464,745, Cl. 370-19.000.

Ruskin, Henry. Staplers. 4,463,890, Cl. 227-132.000.

Russell, Gilbert E.; and Wong, Hee, to National Semiconductor Corporation. Digital color modulator. 4,464,676, Cl. 358-37.000.

Russell, Michael R.: *See*—
Brunone, William T.; Mode, Duane; and Russell, Michael R., 4,463,893, Cl. 229-43.000.

Ruter, Bernhard: *See*—
Hermann, Wolfgang; Ruter, Bernhard; Gorris, Rainer; and Nowak, Herbert, 4,463,690, Cl. 110-336.000.

Ruti-te Strake B.V.: *See*—
van Mullekom, Hubert P., 4,463,910, Cl. 242-47.120.

Ryan, James G.: *See*—
Roberts, Stanley; and Ryan, James G., 4,464,701, Cl. 361-313.000.

Rydquist, Jan E.; Sandberg, Lars; and Wallin, Ralf, to AB Volvo. Turbocharged internal combustion engine with boost pressure and ignition timing control for preventing knocking combustion. 4,463,565, Cl. 60-602.000.

Ryo-Nichi Co., Ltd.: *See*—
Makino, Tetsuya; Itazawa, Masakatsu; and Ogura, Kenzi, 4,464,517, Cl. 526-88.000.

Rypkema, Jouke N., to Zenith Electronics Corporation. Non-reactive limiter. 4,464,635, Cl. 330-284.000.

Rytting, Howard J.: *See*—
Higuchi, Takeru; Nishihata, Toshiaki; and Rytting, Howard J., 4,464,363, Cl. 424-232.000.

S-Cubed: *See*—
Ginn, Warren G., 4,464,660, Cl. 340-870.380.

S. Himmelstein and Company: *See*—
Himmelstein, Sydney, 4,463,629, Cl. 74-862.000.

Saab-Scania Aktiebolag: *See*—
Bergqvist, Lars K., 4,464,659, Cl. 340-825.700.

Saalmann, Gunter; and Haslberger, Richard, to Lang Apparatebau GmbH. Apparatus for supplying detergent concentrate. 4,463,582, Cl. 68-17.00R.

Sabia, Raffaele A., to AT&T Bell Laboratories. Filled optical fiber cables. 4,464,013, Cl. 350-96.230.

Sagisaka, Yasuo; Fukue, Naofumi; and Kondo, Toshio, to Nippondenso Co., Ltd. Device for controlling atomization of fuel in internal combustion engine. 4,463,740, Cl. 123-568.000.

Saidla, Glen W., to Whitney & Company, Inc. Reaction injection molding system for expanded synthetic articles. 4,464,320, Cl. 264-45.500.

Saikkonen, Pekka J. Process for recovering non-ferrous metal values from ores, concentrates, oxidic roasting products or slags. 4,464,344, Cl. 423-5.000.

St. Jacques, Joseph A.: *See*—
Hegyi, Steven M.; and St. Jacques, Joseph A., 4,464,004, Cl. 339-111.000.

St-Onge, Joseph C. M.: *See*—
Plante, Joseph L. P.; Kluchert, Rolf E.; and St-Onge, Joseph C. M., 4,464,131, Cl. 441-29.000.

Saito, Norio: *See*—
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Shiroi, Takashi; Sasaoka, Michio; and Saito, Norio, 4,464,237, Cl. 204-81.000.

Saito, Shoichi; and Shirako, Hideo, to Olympus Optical Co., Ltd. Tape cassette storage box. 4,463,996, Cl. 312-9.000.

Saito, Tadao: *See*—
Yoshino, Yataro; Tsukada, Takami; Saito, Tadao; and Nozawa, Takamitsu, 4,463,860, Cl. 215-12.00R.

Saito, Yoshikuni; Hashimoto, Hitoshi; Arai, Isao; and Wada, Minoru, to Honda Giken Kogyo Kabushiki Kaisha. Composite boring and honing machine and method of making the same. 4,463,490, Cl. 29-566.100.

Saka, Terumasa: *See*—
Kawakami, Shigenao; Saka, Terumasa; Ura, Shigeru; Iwata, Mikio; Tokugawa, Yoshiharu; and Jinno, Naoyoshi, 4,464,505, Cl. 524-512.000.

Sakai, Yoshiki; Imaki, Katsuhiro; and Muryobayashi, Takashi, to Ono Pharmaceutical Co., Ltd. Use of prostaglandin analogues to treat cytodamage. 4,464,388, Cl. 424-275.000.

Sakakibara, Kenji, to Brother Kogyo Kabushiki Kaisha. Detent apparatus for print wheel. 4,464,071, Cl. 400-144.200.

Sakakibara, Shiro: *See*—
Kawamoto, Mutsumi; and Sakakibara, Shiro, 4,464,145, Cl. 474-28.000.

Sakamoto, Masaharu: *See*—
Kato, Kiichi; Sakamoto, Masaharu; Yoshikawa, Shoji; Yamamiya, Kunio; Kodama, Hiroshi; and Ohsima, Ken, 4,464,050, Cl. 356-237.000.

Sakamoto, Ryuji: *See*—
Takahashi, Yoshio; Ozawa, Takeo; Sakamoto, Ryuji; Kanari, Katsuhiko; and Kamimoto, Masayuki, 4,463,799, Cl. 165-10.000.

Sakoda, Akito: *See*—
Wakano, Shigeru; Sakoda, Akito; Fukui, Kunihiro; and Nishihara, Minoru, 4,464,232, Cl. 204-28.000.

Salhi, Ali: *See*—
Labeeuw, Bernard; and Salhi, Ali, 4,464,367, Cl. 424-246.000.

Sallach, Max E.: *See*—
Wallace, Lynn A.; and Sallach, Max E., 4,463,946, Cl. 272-111.000.

Sanada, Yuichi: *See*—
Shibata, Junichi; Sanada, Yuichi; and Shingyooji, Shigeo, 4,463,624, Cl. 74-493.000.

Sanda, Joseph, to Kohle Energy Research Consultants Inc. Reagent and process for recovering oil and kerogens from oil shale. 4,464,246, Cl. 208-11.0LE.

Sandberg, Karen R.: *See*—
Turbak, Albin F.; Snyder, Fred W.; and Sandberg, Karen R., 4,464,287, Cl. 252-312.000.

Sandberg, Lars: *See*—
Rydquist, Jan E.; Sandberg, Lars; and Wallin, Ralf, 4,463,565, Cl. 60-602.000.

Sanders Associates, Inc.: *See*—
Rusch, William T., 4,464,745, Cl. 370-19.000.

Sanders, Edward, Jr.: *See*—
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Hudson, Wilbur G.; Webb, Tommy W.; Phillips, William S.; Tompa, Thomas J.; and Sanders, Edward, Jr., 4,463,669, Cl. 100-43.000.

Sanders, Herbert L. Emulsifier system. 4,464,288, Cl. 252-312.000.

Sanders, Robert E., Jr.: *See*—
Hildeman, Gregory J.; and Sanders, Robert E., Jr., 4,464,199, Cl. 75-249.000.

Sandoz Ltd.: *See*—
Baumann, Hans-Peter, 4,464,180, Cl. 8-557.000.

Sangamo Weston Limited: *See*—
Thomas, David E.; Jeffrey, David M.; and Simms, David W., 4,464,626, Cl. 324-156.000.

Sanjiki, Tetsutaro: *See*—
Atsumi, Toshio; Tarumi, Yuzo; Sanjiki, Tetsutaro; Takebayashi, Yoshiaki; and Yoshida, Noboru, 4,464,531, Cl. 536-17.400.

Sanko Chemical Co., Ltd.: *See*—
Umemoto, Yoshiro; Sanmiya, Tsugumi; and Kato, Mituo, 4,464,499, Cl. 524-230.000.

Sankyo Co., Ltd.: *See*—
Kobayashi, Shinsaku; Kamoshita, Katsuo; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Takashi; and Kojima, Mikio, 4,464,375, Cl. 424-251.000.

Sanmiya, Tsugumi: *See*—
Umemoto, Yoshiro; Sanmiya, Tsugumi; and Kato, Mituo, 4,464,499, Cl. 524-230.000.

Sano, Yasuro, to Janome Sewing Machine Co., Ltd. Fabric feed amount adjusting device of sewing machine. 4,463,694, Cl. 112-158.00A.

Sanofi: *See*—
Labeeuw, Bernard; and Salhi, Ali, 4,464,367, Cl. 424-246.000.

Santen Pharmaceutical Co., Ltd.: *See*—
Iwao, Jun-ichi; Iso, Tadashi; and Oya, Masayuki, 4,464,371, Cl. 424-250.000.

Sapiezynski, Wiesław: *See*—
Milewski, Witold; Brennek, Jerzy; Stanikowski, Lech; Kunicki, Wojciech; Sapiezynski, Wieslaw; Konopczynski, Andrzej; and Kondratowicz, Zbigniew, 4,464,414, Cl. 427-37.000.

Sarnecki, Wilhelm: *See*—
Autzen, Horst; Motz, Herbert; Rudolf, Peter; Sarnecki, Wilhelm; Steck, Werner; and Vaeth, Guenter, 4,464,352, Cl. 423-634.000.

Sartran, Bernard C., to Aro Corporation, The. Special screw feed mechanism for screws, bolts, rivets, nails, etc. 4,463,889, Cl. 227-112.000.

Sasaoka, Michio: *See*—
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Shiroi, Takashi; Sasaoka, Michio; and Saito, Norio, 4,464,237, Cl. 204-81.000.

Satake Engineering Co., Ltd.: *See*—
Satake, Toshihiko; Kagawa, Kiyoto; and Ariji, Shigeru, 4,463,665, Cl. 99-488.000.

Satake, Toshihiko; Kagawa, Kiyoto; and Ariji, Shigeru, to Satake Engineering Co., Ltd. Pressure plate adjusting device for grain whitening apparatus. 4,463,665, Cl. 99-488.000.

Sato, Eiichi, to Osaka Kagaku Gokin Kabushiki Kaisha. Device for cutting off knotted ends of tube bags. 4,463,641, Cl. 83-175.000.

Sato, Takahisa; Nakashima, Sumio; and Baba, Masao, to Nippon Shokubai Kagaku Kogyo Co. Ltd. Process for producing acrylic or methacrylic esters. 4,464,229, Cl. 203-60.000.

Sato, Takeshi: *See*—
Kishima, Noboru; Ueda, Yoshio; and Sato, Takeshi, 4,464,485, Cl. 521-64.000.

Sato, Terumi: *See*—
Iwabuchi, Takeshi; Morinaga, Hiroshi; Kawahara, Masao; Kamiyama, Sakae; Sato, Terumi; and Yokota, Muneto, 4,464,518, Cl. 526-127.000.
Sato, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. System and apparatus for controlling the unwinding of coiled material. 4,463,913, Cl. 242-57.000.
Sato, Yoshihisa: *See*—
Ohta, Saburo; Nakamura, Shoji; Hayashi, Katsutake; Yomogida, Katsuyuki; Moroboshi, Hideo; Hirose, Seiichi; Uehara, Keiichi; Aizawa, Masanori; Sato, Yoshihisa; Ichikawa, Hideyuki; Tejima, Masayuki; and Togano, Seisaku, 4,464,290, Cl. 252-522.00R.
Saunders, Frances C.: *See*—
Harrison, Kenneth J.; Raynes, Edward P.; Saunders, Frances C.; and Thompson, David J., 4,464,282, Cl. 252-299.100.
Sawazaki, Norikazu; and Chiba, Shu, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetic reproducing system. 4,464,691, Cl. 360-111.000.
Sayles, David C., to United States of America, Army. Method of generating single-event, unconfined fuel-air detonation. 4,463,680, Cl. 102-363.000.
Scartazzini, Riccardo: *See*—
Wehrli, Hansuli; Kocsis, Karoly; and Scartazzini, Riccardo, 4,464,366, Cl. 424-246.000.
Scata, Umberto; Albizzati, Enrico; and Giannetti, Enzo, to Montedison S.p.A. Catalyst components and catalysts for polymerizing olefins. 4,464,478, Cl. 502-111.000.
Schaeffner, Pierre: *See*—
Berger, Michel; and Schaeffner, Pierre, 4,464,446, Cl. 429-190.000.
Schafer, Max: *See*—
Berger, Rolf; Bonnen, Josef; Haffmans, Josef; Schafer, Max; Teetz, Wolfgang; and Gierse, Franzjosef, 4,463,692, Cl. 112-102.000.
Schaus, Herbert J. Methods and apparatus for the control of smoke and fire in buildings. 4,463,896, Cl. 236-49.000.
Scheible, Howard G.; and Berkshire, Jon B., to RCA Corporation. Wave soldering apparatus and method. 4,463,891, Cl. 228-180.00R.
Schering Aktiengesellschaft: *See*—
Bittler, Dieter; Laurent, Henry; Weichert, Rudolf; Casals-Stenzel, Jorge; and Schillinger, Ekkehard, 4,464,364, Cl. 424-241.000.
Hofmeister, Helmut; Petzoldt, Karl; Annen, Klaus; Laurent, Henry; Wiechert, Rudolf; and Nishino, Yukeshige, 4,464,365, Cl. 424-243.000.
Schering Corporation: *See*—
Bristol, James A.; and Lovey, Raymond G., 4,464,372, Cl. 424-250.000.
Scherrer, Robert A.; and Moore, George G. I., to Riker Laboratories, Inc. Enamines, pharmaceutical compositions, methods, synthetic processes and intermediates. 4,464,536, Cl. 546-213.000.
Scheuermann, Hans: *See*—
Pikorz, Wolfgang; Scheuermann, Hans; and Sonntag, Alois, 4,464,441, Cl. 428-579.000.
Schievelbein, Vernon H., to Texaco Inc. Method for restoring permeability of injection wells. 4,464,268, Cl. 252-8.55B.
Schiff, Leonard N.; and Freeman, Smith, to RCA Corporation. Time window key system for video scrambling. 4,464,678, Cl. 358-122.000.
Schilling, Peter, to Westvaco Corporation. Amphoterics as emulsifiers for bituminous emulsions. 4,464,285, Cl. 252-311.500.
Schilling, Peter, to Westvaco Corporation. Cationic bituminous emulsions. 4,464,286, Cl. 252-311.500.
Schillinger, Ekkehard: *See*—
Bittler, Dieter; Laurent, Henry; Weichert, Rudolf; Casals-Stenzel, Jorge; and Schillinger, Ekkehard, 4,464,364, Cl. 424-241.000.
Schimko, Reinhold; and Koninger, Josef, to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. Flat knitting machine having a presser foot device. 4,463,577, Cl. 66-64.000.
Schimko, Reinhold; Lutz, Albert; and Kuhnert, Gottfried, to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG. Single or multiple cam unit for knitting machines. 4,463,578, Cl. 66-75.100.
Schimko, Reinhold; and Kuhnert, Gottfried, to Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG. Double cam unit for knitting machines. 4,463,579, Cl. 66-75.100.
Schimmel, Vernon R., to Symons Corporation. Concrete form structure including one-way escape hinge. 4,463,925, Cl. 249-11.000.
Schlagmuller, Walter: *See*—
Babitzka, Rudolf; Beck, Walter; and Schlagmuller, Walter, 4,463,727, Cl. 123-458.000.
Schleese, Eckard: *See*—
Voigt, Hermann U.; and Schleese, Eckard, 4,464,425, Cl. 428-35.000.
Schlosser, Helmut, to Kuhl Bauelemente GmbH. Grave marker for memorial. 4,463,527, Cl. 52-103.000.
Schlough, James R., to Stobb, Inc. Method and apparatus for opening folded sheets. 4,463,941, Cl. 270-54.000.
Schlumberger Technology Corporation: *See*—
Flaum, Charles, 4,464,569, Cl. 250-270.000.
Schmalenbach, Erich: *See*—
Rastetter, Adolf; and Schmalenbach, Erich, 4,463,481, Cl. 183-67.000.
Schmid, Rene: *See*—
Oehy, Peter; and Schmid, Rene, 4,463,480, Cl. 19-159.00A.
Schmidt, Edward J. Covering device for tracheostomy stoma. 4,463,757, Cl. 128-205.290.
Schmidt, Wilfried: *See*—
Finkenzeller, Johann; Schmidt, Wilfried; and Reinfelder, Heinz, 4,464,779, Cl. 378-176.000.
Schmidtpott, Friedrich: *See*—
Backes, Reiner; Schmidtpott, Friedrich; and Neal, Mathew, 4,464,773, Cl. 377-116.000.
Schmieder, Daniel J.: *See*—
McDowell, Leon H.; Weber, Roger E.; and Schmieder, Daniel J., 4,463,605, Cl. 73-432.0SD.
Schmits, Heinz-Herbert: *See*—
Heinemann, Otto; Baldus, Heinz-Dieter; and Schmits, Heinz-Herbert, 4,464,112, Cl. 432-106.000.
Schmitt, Stephen A.: *See*—
Dixon, Jerry D.; Farrell, Robert H.; Merckel, Gerald U.; Neely, Jack D.; Schmitt, Stephen A.; Verdoorn, William G., Jr.; and Bandy, Peter B., 4,464,718, Cl. 364-200.000.
Schmittner, Dieter; and Schwarz, Manfred, to Elster AG Mess- und Regeltechnik. Calibratable turbine wheel gas meter with exchangeable measuring insert. 4,463,613, Cl. 73-861.830.
Schmitz, Horst; and Krompass, Wolfgang, to Krauss-Maffei Aktiengesellschaft. Mixing head for reactive materials. 4,464,056, Cl. 366-134.000.
Schmolz, Herbert: *See*—
Polzer, Erich; Ruetz, Gottfried; Schmolz, Herbert; and Pochon, Remy, 4,463,556, Cl. 60-330.000.
Schneider, Manfred. Electronic chess clock. 4,464,060, Cl. 368-96.000.
Schnell, Willi: *See*—
Halter, Hartmut; and Schnell, Willi, 4,464,319, Cl. 264-40.100.
Schoendorfer, Donald W.; and Hansen, Lee E., to Haemonetics Corporation. Pheresis apparatus. 4,464,167, Cl. 604-6.000.
Schoering, Eberhad, to Hoechst Aktiengesellschaft. Processing unit for developing photosensitive materials. 4,464,035, Cl. 354-299.000.
Schoolcraft, Richard J., to Helicopter Training Systems, Inc. Helicopter flight training device. 4,464,116, Cl. 434-33.000.
Schott, Lawrence A.; and Schott, Roger A. Indexable insert grinding machine. 4,463,524, Cl. 51-127.000.
Schott, Roger A.: *See*—
Schott, Lawrence A.; and Schott, Roger A., 4,463,524, Cl. 51-127.000.
Schreyer, Kenneth D.; and Cooper, Alton H., to Columbus McKinnon Corporation. Clutch/brake mechanism. 4,463,933, Cl. 254-368.000.
Schroeder, Donald E., Jr., to Marathon Oil Company. Apparatus and method for preparing polymers. 4,464,509, Cl. 525-53.000.
Schroeder, Eugene R., to Westinghouse Electric Corp. Illumination flicker meter. 4,464,049, Cl. 356-218.000.
Schroeder, George F.; Pitt, Garry E.; Scully, John F.; and Barnes, Lell E., to Singer Company, The. Multiple event hardened core memory. 4,464,752, Cl. 371-38.000.
Schubert & Salzer Maschinenfabrik Aktiengesellschaft: *See*—
Karl, Rupert; and Mayer, Walter, 4,463,548, Cl. 57-263.000.
Schulte, Heinz: *See*—
Mucheyer, Norbert; and Schulte, Heinz, 4,463,660, Cl. 91-469.000.
Schulte, John J.: *See*—
Bridges, David B.; and Schulte, John J., 4,464,142, Cl. 464-92.000.
Schultz, Eugene L.: *See*—
Pols, Sidney; and Schultz, Eugene L., 4,463,761, Cl. 128-581.000.
Schultz, Frederick E., to General Electric Company. Turbomachinery rotor and method of manufacture. 4,464,097, Cl. 416-230.000.
Schultz, Roland P.; and Schultz, William G. Elbow cover. 4,463,780, Cl. 138-178.000.
Schultz, William G.: *See*—
Schultz, Roland P.; and Schultz, William G., 4,463,780, Cl. 138-178.000.
Schulz, Axel; and Staude, Werner, to Robert Bosch GmbH. Method and apparatus for concealing errors in a digital television signal. 4,464,674, Cl. 358-21.00R.
Schutte, Valentin H.: *See*—
Kommoss, Klaus; and Schutte, Valentin H., 4,464,695, Cl. 360-137.000.
Schwager, Anton; and Suter, Hans-Jorg, to Contraves AG. Circuit for generating a sinusoidal synchronization voltage for firing thyristors. 4,464,620, Cl. 323-300.000.
Schwarz, Edward L., to Control Data Corporation. Derrieus wind turbine electric generating system. 4,464,579, Cl. 290-44.000.
Schwarz, Gerhard E.; and Bergk, Gunther, to Braun Aktiengesellschaft. Circuit arrangement for the controlled supply to a load. 4,464,619, Cl. 320-40.000.
Schwarz, Manfred: *See*—
Schmittner, Dieter; and Schwarz, Manfred, 4,463,613, Cl. 73-861.830.
Schwencke, Maria N.: *See*—
Bisagni, Emile; Dubertret, Louis; Moron, Jacqueline; Averbeck, Dietrich; Papadopoulo, Dora; Blais, Jocelyne; Vigny, Paul; Schwencke, Maria N.; Moustacchi, Ethel; Nocentini, Silvano; and Zajdela, Francois, 4,464,354, Cl. 424-59.000.
Schwenk, Gerhard: *See*—
Kaule, Wittich; Schwenk, Gerhard; and Stenzel, Gerhard, 4,463,970, Cl. 283-72.000.
SCM Corporation: *See*—
Herzing, Anthony G.; and Palamidis, Nickolas, 4,464,411, Cl. 426-613.000.
Scott, Warner C.; and Wiggins, Richard H., to Texas Instruments Incorporated. Didactic device to improve penmanship and drawing skills. 4,464,118, Cl. 434-85.000.
Scrosati, Bruno: *See*—
Lazzari, Mario; and Scrosati, Bruno, 4,464,447, Cl. 429-194.000.
Scully, John F.: *See*—
Schroeder, George F.; Pitt, Garry E.; Scully, John F.; and Barnes, Lell E., 4,464,752, Cl. 371-38.000.

Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britian and Northern Ireland, The: *See—*
Harrison, Kenneth J.; Raynes, Edward P.; Saunders, Frances C.; and Thompson, David J., 4,464,282, Cl. 252-299.100.
Seidman, Martin: *See—*
Niekamp, Carl W.; and Seidman, Martin, 4,464,204, Cl. 127-36.000.
Seidner, Steven, to Vision Laboratories Inc. Intraocular lens and implantation method. 4,463,458, Cl. 3-13.000.
Seisakusho Kabushiki Kaisha Toyoda Jidoshokki: *See—*
Suzuki, Hajime; and Mitsuya, Kinpei, 4,463,783, Cl. 139-435.000.
Sekhar, Jainagesh A.: *See—*
Risbud, Subhash H.; and Sekhar, Jainagesh A., 4,464,557, Cl. 219-121.0LM.
Seki, Nagataka, to Tokyo Shibaura Denki Kabushiki Kaisha. Gate circuit of gate turn-off thyristor. 4,464,585, Cl. 307-252.00C.
Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See—*
Tsubone, Masahiro; and Machida, Bon, 4,463,861, Cl. 215-12.00R.
Sekiya, Kunihiko; Mizuguchi, Mamoru; and Ohzeki, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Thermal printer. 4,464,669, Cl. 346-76.0PH.
Selegny, Eric: *See—*
Avrameas, Stratis; Broun, Georges; Selegny, Eric; and Thomas, Daniel, 4,464,468, Cl. 435-177.000.
Semm, Kurt. Apparatus and method for insufflating fluid media into a cavity. 4,464,169, Cl. 604-26.000.
Semmerling, Ralph P.: *See—*
Green, William J.; and Semmerling, Ralph P., 4,464,074, Cl. 403-192.000.
Sencar, Joze: *See—*
Vasak, Vladimir; Sencar, Joze; and Mok, King K., 4,464,351, Cl. 423-486.000.
Senda, Atsuo; Kato, Suehiro; and Kasanami, Toru, to Murata Manufacturing Co., Ltd. Process for preventing oxidation of copper film on ceramic body. 4,464,422, Cl. 427-124.000.
Senftle, Frank E.: *See—*
Dotson, Danny W.; Mikesell, Jon L.; and Senftle, Frank E., 4,464,338, Cl. 422-78.000.
Senko Medical Instrument Mfg., Co., Ltd.: *See—*
Thuc, Tran N., 4,463,756, Cl. 128-204.210.
Seragnoli, Enzo, to G. D. Societa per Azioni. Continuous twin rod cigarette-making machine. 4,463,767, Cl. 131-84.00B.
Serni Limited: *See—*
Wozniak, Jan C., 4,464,084, Cl. 405-288.000.
Setra Systems, Inc.: *See—*
Briefer, Dennis K., 4,464,725, Cl. 364-571.000.
Lee, Shih-Ying, 4,463,614, Cl. 73-862.640.
Setsune, Kentaro, to Matsushita Electric Industrial Co., Ltd. Surface acoustic wave device comprising an interdigital transducer having omitted fingers. 4,464,597, Cl. 310-313.00B.
Seybold, Guenther, to BASF Aktiengesellschaft. Mixtures of optical brighteners. 4,464,284, Cl. 252-301.210.
Seynhaeve, Andre G., to Societe Delsey. Wheeled suitcase. 4,463,840, Cl. 190-18.00A.
Shafer, David R., to Center Art Galleries. Binocular stereoscopic viewers. 4,464,015, Cl. 350-138.000.
Shanley, Robert L., II: *See—*
Harwood, Leopold A.; and Shanley, Robert L., II, 4,464,633, Cl. 330-254.000.
Shannon, Roger L.: *See—*
Pogson, John T.; Shannon, Roger L.; Hamasaki, Robert H.; Franklin, James L.; Watkins, Dale F.; and Kramer, Ted J., 4,463,798, Cl. 165-1.000.
Sharp Kabushiki Kaisha: *See—*
Nishimura, Kosuke, 4,464,731, Cl. 364-900.000.
Yoshida, Kunio; and Ikemoto, Yutaka, 4,464,059, Cl. 368-63.000.
Sharps, Gordon V., Jr.: *See—*
Colombo, Edward A.; and Sharps, Gordon V., Jr., 4,464,219, Cl. 156-251.000.
Shaw, Paul R.: *See—*
Coburn, John A., Jr.; and Shaw, Paul R., 4,463,870, Cl. 220-307.000.
Shearer, David R.: *See—*
Fuller, Berkeley; Soll, Linda; Obrecht, Margretta; Poole, Gary; Campbell, Edward F., Jr.; Parsons, Margaret; Chun, Valerie P. P.; Shearer, David R.; and Cashman, Thomas M., 4,464,122, Cl. 434-262.000.
Sheber, Thomas F. Hand-held cleaning tool with remote water turbine power source. 4,463,525, Cl. 51-170.00R.
Sheets, Richard D.; and Huffman, Donald R., to Huntington Laboratories, Inc. Germicide and an improved method for killing bacteria, fungus and/or viruses. 4,464,398, Cl. 424-329.000.
Shell Oil Company: *See—*
Barlow, Peter L., 4,464,427, Cl. 428-40.000.
Sherwin-Williams Company, The: *See—*
Karickhoff, Michael, 4,464,524, Cl. 526-313.000.
Shibata, Junichi; Sanada, Yuichi; and Shingyooji, Shigeo, to Nissan Motor Company, Limited. Tiltable steering wheel. 4,463,624, Cl. 74-493.000.
Shibuya, Tsunenori, to T. Shibuya (Diesel Kiki Co., Ltd.). Seizure-free, highly fluid tight and lightweight vane compressor. 4,464,101, Cl. 418-125.000.
Shiibayashi, Masao: *See—*
Machida, Shigeru; Tojo, Kenji; Ikegawa, Masato; and Shiibayashi, Masao, 4,464,100, Cl. 418-55.000.
Shima, Kenzo: *See—*
Tanaka, Minoru; Ishizuka, Takeshi; and Shima, Kenzo, 4,463,744, Cl. 123-643.000.
Shimada, Kiyoshi: *See—*
Hayashi, Yoshimasa; and Shimada, Kiyoshi, 4,463,721, Cl. 123-378.000.
Shimano, Akira: *See—*
Kiriake, Masaharu; and Shimano, Akira, 4,463,909, Cl. 242-35.50A.
Shimizu, Hiroshi, to Nippon Electric Co., Ltd. Burst signal transmission system. 4,464,765, Cl. 375-17.000.
Shimizu, Takao: *See—*
Mizuno, Takaji; and Shimizu, Takao, 4,464,558, Cl. 219-130.210.
Shinada, Kazuyoshi: *See—*
Aso, Kinichi; and Shinada, Kazuyoshi, 4,464,128, Cl. 440-112.000.
Shinbori, Takeyoshi; Takadera, Ichiro; and Fukumura, Takeo, to NHK Spring Co., Ltd. Apparatus for controlling friction between the leaf springs of a laminated leaf spring assembly of a vehicle. 4,463,936, Cl. 267-36.00A.
Shingyooji, Shigeo: *See—*
Shibata, Junichi; Sanada, Yuichi; and Shingyooji, Shigeo, 4,463,624, Cl. 74-493.000.
Shinmei Engineering Company Limited: *See—*
Yonekawa, Tadao, 4,463,935, Cl. 266-233.000.
Shinoda, Kazuo, to Toyota Jidosha Kabushiki Kaisha. Electronically controlled exhaust gas recirculation apparatus. 4,463,741, Cl. 123-571.000.
Shinozaki, Nozomu; Dohi, Takashi; and Neki, Shigeo, to Matsushita Electric Industrial Co., Ltd. Needle position detector. 4,463,698, Cl. 112-275.000.
Shioda, Toshiyuki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Apparatus for producing containerless sand molds. 4,463,794, Cl. 164-182.000.
Shionogi & Co., Ltd.: *See—*
Uyeo, Shoichiro, 4,464,299, Cl. 260-245.20T.
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, to Canon Kabushiki Kaisha. Electrophotographic image-forming member having aluminum oxide layer on a substrate. 4,464,451, Cl. 430-65.000.
Shirako, Hideo: *See—*
Saito, Shoichi; and Shirako, Hideo, 4,463,996, Cl. 312-9.000.
Shiroi, Takashi: *See—*
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Shiroi, Takashi; Sasaoka, Michio; and Saito, Norio, 4,464,237, Cl. 204-81.000.
Shiseido Company Ltd.: *See—*
Ohta, Saburo; Nakamura, Shoji; Hayashi, Katsutake; Yomogida, Katsuyuki; Morohoshi, Hideo; Hirose, Seiichi; Uehara, Keiichi; Aizawa, Masanori; Sato, Yoshihisa; Ichikawa, Hideyuki; Tejima, Masayuki; and Togano, Seisaku, 4,464,290, Cl. 252-522.00R.
Shito, Naomichi: *See—*
Kojima, Tadashi; Uchihama, Tetsuo; Tanaka, Kazuyoshi; Morozumi, Eiichi; Inoue, Kentaro; and Shito, Naomichi, 4,463,773, Cl. 137-38.000.
Shoemaker, James F. Compound field motor. 4,464,618, Cl. 318-794.000.
Shorter, John J.; Woolnough, Victor J.; and Brewer, Michael W., to Chas. A Blatchford & Sons Limited. Endo-skeletal artificial limb. 4,463,459, Cl. 3-30.000.
Shroot, Braham; Maignan, Jean; and Lang, Gerard, to Groupement d'Interet Economique Centre International de Recherches Dermatologiques C.I.R.D. 1,8-Dihydroxy-9-anthrones derivatives substituted in the 10-position by an unsaturated radical and their use in human and veterinary medicine. 4,464,301, Cl. 260-351.000.
Shuker, Brian, to Lewmar Marine Limited. Winch. 4,463,932, Cl. 254-266.000.
Sick, Erwin; Fetzer, Gunter; and Winterer, Hermann, to Erwin Sick GmbH Optik-Elektronik. Retroreflectors, especially for beam scanning applications and beam scanning apparatus incorporating such retroreflectors. 4,464,014, Cl. 350-105.000.
Siegel, Carole E.: *See—*
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,464,376, Cl. 424-253.000.
Siegel, Hardo: *See—*
Gramlich, Walter; Himmele, Walter; Martin, Christoph; Pommer, Ernst-Heinrich; and Siegel, Hardo, 4,464,370, Cl. 424-248.400.
Siemens Aktiengesellschaft: *See—*
Bodlaj, Viktor, 4,464,053, Cl. 356-376.000.
Elmovist, Hakan, 4,463,760, Cl. 128-419.0PG.
Finkenzeller, Johann; Schmidt, Wilfried; and Reinfelder, Heinz, 4,464,779, Cl. 378-176.000.
Goldmann, Norbert, 4,464,778, Cl. 378-150.000.
Grossman, Kurt; and Bliesner, Jurgen, 4,464,010, Cl. 339-272.00R.
Patalong, Hubert, 4,464,673, Cl. 357-38.000.
Plies, Erich, 4,464,571, Cl. 250-305.000.
Siemon Company, The: *See—*
Knickerbocker, Robert H., 4,463,999, Cl. 339-75.00P.
Sier-Bath Gear Company, Inc.: *See—*
Decker, Robert W., 4,464,138, Cl. 464-56.000.
Sig Societe Industrielle Suisse: *See—*
Niehen, Arne, 4,463,682, Cl. 104-12.000.
Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See—*
Cavazza, Claudio, 4,464,393, Cl. 424-316.000.
Signode Corporation: *See—*
Beach, John R., 4,463,911, Cl. 242-55.200.
Silver Industries, Inc.: *See—*
Ennis, James, 4,464,174, Cl. 604-90.000.
Silverman, Daniel; and Johnson, Everett A. Access security control. 4,464,566, Cl. 235-382.000.

Simms, David W.: *See—*
Thomas, David E.; Jeffrey, David M.; and Simms, David W., 4,464,626, Cl. 324-156.000.

Simon, Helmut; Bader, Johann; and Guenther, Helmut, to BASF Aktiengesellschaft. Carrying out electromicrobial reductions. 4,464,235, Cl. 204-73.00R.

Simon, Melvin L., to Vinylex Corporation. Means for securing the components of a decorative molding system. 4,463,539, Cl. 52-717.000.

Simpson, Anthony; Peterkin, Stuart M.; and Brooksby, Brian T., to Detras Training Aids Limited. Pulsed laser range finder training or test device. 4,464,115, Cl. 434-27.000.

Singer Company, The: *See—*
Groudan, Alan I.; Pitt, Garry E.; and Barnes, Lell E., 4,464,747, Cl. 371-50.000.
Killinger, Karl H., 4,463,695, Cl. 112-199.000.
McKenna, Joseph V., 4,464,721, Cl. 364-453.000.
Schroeder, George F.; Pitt, Garry E.; Scully, John F.; and Barnes, Lell E., 4,464,752, Cl. 371-38.000.

Singer, Ronald E.; and Stewart, Raymond A. Combined landscaping and foundation wall protective article. 4,463,529, Cl. 52-169.500.

Sinkes, Donald W. Insulating apparatus for a flue thimble. 4,463,748, Cl. 126-314.000.

Sipos, Geza: *See—*
Kocsis, Jozsef K.; Kiss, Laszlo ; Balajthy, Zoltan; Nagy, Peter; Pai nee Hazkoto, Gizella; Zarubai, Miklos; Sipos, Geza; Romhanyi, Andras; and Kokai, Rudolf, 4,464,504, Cl. 524-443.000.

Sitema, Gesellschaft fur Sicherheitstechnik and Maschinenbau mbH: *See—*
Rastetter, Adolf; and Schmalenbach, Erich, 4,463,481, Cl. 188-67.000.

Sittner, Edward H., to ACF Industries, Incorporated. Adjustable handhold. 4,463,827, Cl. 182-93.000.

Sivilingenior Nybro Hansen A/S: *See—*
Berg, Terie; Hubertz, Trond; Kleiven, Erland; and Torblaa, Ivar, 4,463,987, Cl. 299-2.000.

Siwon, Hans, to Steinel GmbH & Co. K.G. Device for guiding a rod-shaped member formed of a gluing material which can be softened by heat. 4,463,877, Cl. 222-146.0HE.

SKF Mekanprodukter AB: *See—*
Lundgren, Bengt, 4,464,140, Cl. 464-71.000.

Smathers, Robert E.; Wildman, John R.; and Meyer, Burton C., to Marvin Glass & Associates. Combination vehicle and top toy. 4,463,518, Cl. 446-237.000.

Smith, Cecil B.; and Fox, Finis E., to Delta Airlines, Inc. Display panel for aircraft parking. 4,464,648, Cl. 340-51.000.

Smith, David C.: *See—*
Brown, Clyde O.; and Smith, David C., 4,464,021, Cl. 350-354.000.

Smith, Douglas: *See—*
Heller, Martin G.; Pecha, Edward; Smith, Douglas; and Rudder, Joel, 4,463,636, Cl. 83-13.000.

Smith, Stephen L., to Motorola, Inc. In-package E^2PROM redundancy. 4,464,736, Cl. 365-200.000.

Smith, Thomas G.: *See—*
LaBianca, Michael H.; and Smith, Thomas G., 4,464,423, Cl. 427-244.000.

Smithers, James F. Plant hanger frame. 4,463,855, Cl. 211-71.000.

Smollar, Marvin: *See—*
Barlow, Gordon A.; Krutsch, John R.; Smollar, Marvin; and Liedtke, Ronald, 4,463,515, Cl. 446-409.000.

Snijders, Wilfred A. M.; Kalfs, Johannes J. W.; and Van Gerwen, Petrus J., to U.S. Philips Corporation. Arrangement for correcting pulse distortion in homochronous data transmission. 4,464,746, Cl. 370-32.000.

Snyder, Fred W.: *See—*
Turbak, Albin F.; Snyder, Fred W.; and Sandberg, Karen R., 4,464,287, Cl. 252-312.000.

Snyder, Steven A., to Coachmen Industries, Inc. Running board and lighting assembly. 4,463,962, Cl. 280-164.00R.

Sobczak, Isidore F.; Cleveland, William C., Jr.; and Pons, Robert L., to Ford Aerospace & Communications Corporation. Modular solar concentrator. 4,463,749, Cl. 126-451.000.

Sobel, Johannes: *See—*
Matejec, Reinhart; Nittel, Fritz; and Sobel, Johannes, 4,464,464, Cl. 430-546.000.

S.A. Cimenteries C.B.R. Cementbedrijven N.V.: *See—*
Pairon, Guy S., 4,464,201, Cl. 106-90.000.

Societe Anonyme D.B.A.: *See—*
Courbot, Pierre, 4,463,837, Cl. 188-73.380.

Societe Civile Des Composites Electrolytiques: *See—*
Berger, Michel; and Schaeffner, Pierre, 4,464,446, Cl. 429-190.000.

Societe D'Assistance Technique Pour Produits Nestle S.A.: *See—*
Hsu, Jau Y., 4,464,407, Cl. 426-533.000.

Societe Delsey: *See—*
Seynhaeve, Andre G., 4,463,840, Cl. 190-18.00A.

Societe Nationale Elf Aquitaine (Production): *See—*
Sturtz, Georges; Pensec, Thierry; and Gautier, Jean-Claude, 4,464,346, Cl. 423-10.000.

Societe Nationale Industrielle Aerospatiale: *See—*
Michaud-Soret, Jean A., 4,464,429, Cl. 428-117.000.

Societe Syselec (S.A.R.L.): *See—*
Vaucheri, Patrice; and Lefebvre, Henri, 4,464,129, Cl. 441-16.000.

Societes Anonymes: Automobiles Citroen et Automobiles Peugeot: *See—*
Martineau, Yves, 4,464,313, Cl. 261-78.00R.

Sodder, George, Jr.; and Costa, Dominick. Illumination device and method of use in tunnel alignment. 4,463,986, Cl. 299-1.000.

Soes, Lucas, to AMP Incorporated. Electrical switch having selective coding capability. 4,464,550, Cl. 200-46.000.

Sokolsky, Valery N.: *See—*
Vildgrube, Georgy S.; Kutuzov, Boris N.; Sokolsky, Valery N.; Misulovin, Leon Y.; and Kotov, Boris A., 4,464,119, Cl. 434-185.000.

Soll, Linda: *See—*
Fuller, Berkeley; Soll, Linda; Obrecht, Margretta; Poole, Gary; Campbell, Edward F., Jr.; Parsons, Margaret; Chun, Valerie P. P.; Shearer, David R.; and Cashman, Thomas M., 4,464,122, Cl. 434-262.000.

Somersett Moon Ltd.: *See—*
Kirk, Alexis V., 4,463,455, Cl. 2-338.000.

Sonic Tape Public Limited Company: *See—*
Czajkowski, Stanislaw B., 4,464,738, Cl. 367-97.000.

Sonneborn, Lamburtus J., to Applied Power Inc. Tilt cab truck in which the cab is partially supported by the tilting cylinder while in the drive position. 4,463,818, Cl. 180-89.150.

Sonntag, Alois: *See—*
Pikorz, Wolfgang; Scheuermann, Hans; and Sonntag, Alois, 4,464,441, Cl. 428-579.000.

Sony Corporation: *See—*
Ikeda, Tamon, 4,464,553, Cl. 219-10.49R.
Takizawa, Kazuyuki; Izumi, Takao; and Kodama, Makoto, 4,464,743, Cl. 369-75.200.
Wilkinson, James H., 4,464,685, Cl. 358-310.000.

Sopori, Bhushan L.; and Wolf, Abraham, to United States of America, Energy. Apparatus for sectioning demountable semiconductor samples. 4,463,927, Cl. 249-95.000.

Sorensen, Bendt H., to Motorola, Inc. Phase-locked loop circuit arrangement. 4,464,771, Cl. 375-120.000.

Sorensen, Jens O. Injection molding of thermoplastics in sandwich mold employing desynchronized injection periods. 4,464,327, Cl. 264-328.800.

Southmedic Incorporated: *See—*
McDonald, Sandy, 4,463,754, Cl. 128-200.140.

Spangler, Glenn C. Extensible tape heater. 4,464,565, Cl. 219-550.000.

Special Products Engineering Corporation: *See—*
Cogswell, John; Fokos, Robert F.; and Alden, Dale E., 4,463,640, Cl. 83-116.000.

Spector, Donald. Exercise machine. 4,463,945, Cl. 272-73.000.

Speedcut, Inc.: *See—*
Goellner, Willy J., 4,463,645, Cl. 83-852.000.

Speir, Leslie G.; and Adams, Edwin L., to United States of America, Energy. Apparatus for irradiating a continuously flowing stream of fluid. 4,464,330, Cl. 376-159.000.

Spellmann, Richard A., to Chevron Research Company. Off-line method of depicting piping items of pipe specification files of a computer-aided graphics system, without duplicatioes occurring. 4,464,719, Cl. 364-300.000.

Sperry Corporation: *See—*
Eastman, Willard L.; Lempel, Abraham; Ziv, Jacob; and Cohn, Martin, 4,464,650, Cl. 340-347.0DD.
Huie, Jaken Y.; and Jacobus, Dan, 4,464,704, Cl. 361-414.000.
Jackson, Robert E.; Crawford, Leroy A.; and Webb, Bryant F., 4,463,668, Cl. 100-24.000.
Jennings, James, 4,464,774, Cl. 377-117.000.
Jennings, Richard E., 4,464,137, Cl. 464-48.000.

Spethmann, Donald H.; and Emerson, Lucy T. Y., to Honeywell Inc. Optimized selection of dissimilar chillers. 4,463,574, Cl. 62-175.000.

Spica S.p.A.: *See—*
Roca-Nierga, Manuel; and Forapianti, Mauro, 4,463,726, Cl. 123-449.000.

Sprecker, Mark A.; and Whelan, Patrick, to International Flavors & Fragrances Inc. Process for enhancing or augmenting the aroma of perfume compositions, colognes and perfumed articles using norbornyl diesters. 4,464,291, Cl. 252-522.00R.

Spyra, Wolfgang: *See—*
Brandis, Helmut; Spyra, Wolfgang; and Reismann, Josef, 4,464,335, Cl. 420-584.000.

SRI International: *See—*
Dawson, Marcia I., 4,464,389, Cl. 424-278.000.
Fieldsteel, A. Howard; Cox, David L.; and Moeckli, Randolph A., 4,464,470, Cl. 435-253.000.
Mosher, Carol W.; Tong, George L.; and Acton, Edward M., 4,464,529, Cl. 536-6.400.

Stahn, Roland: *See—*
Fabricius, Hans-Ake; and Stahn, Roland, 4,464,355, Cl. 424-101.000.

Stamicarbon B.V.: *See—*
de Lathouder, Hans C., 4,464,483, Cl. 518-703.000.

Stamm, David A., to Daisy Systems Corporation. Memory accessing method. 4,464,715, Cl. 364-200.000.

Stampfer, Joseph F., Jr.: *See—*
Hitchcock, William S.; and Stampfer, Joseph F., Jr., 4,464,343, Cl. 423-3.000.

Standard Oil Company (Indiana): *See—*
Cousineau, Thomas J.; and Cengel, John A., 4,464,277, Cl. 252-56.00S.
Thacker, Milton B., 4,464,247, Cl. 208-11.00R.

Stanikowski, Lech: *See*—
Milewski, Witold; Brennek, Jerzy; Stanikowski, Lech; Kunicki, Wojciech; Sapiezynski, Wieslaw; Konopczynski, Andrzej; and Kondratowicz, Zbigniew, 4,464,414, Cl. 427-37.000.
Stanley Vemco: *See*—
Duhame, Dean C., 4,464,651, Cl. 340-521.000.
Staples, Edward J., to Rockwell International Corporation. Ferroelectric surface acoustic wave devices. 4,464,639, Cl. 333-154.000.
Staskawicz, Brian J.: *See*—
Orser, Cindy S.; Lindow, Steven E.; Panopoulos, Nickolas J.; and Staskawicz, Brian J., 4,464,473, Cl. 435-172.300.
Staude, Werner: *See*—
Schulz, Axel; and Staude, Werner, 4,464,674, Cl. 358-21.00R.
Stauffer Chemical Company: *See*—
Prisbylla, Michael P., 4,464,194, Cl. 71-87.000.
Steck, Werner: *See*—
Autzen, Horst; Motz, Herbert; Rudolf, Peter; Sarnecki, Wilhelm; Steck, Werner; and Vaeth, Guenter, 4,464,352, Cl. 423-634.000.
Steckenrider, Paul E., to Union Special Corporation. Sewing machine looper throw-out mechanism. 4,463,696, Cl. 112-200.000.
Steckler, Steven A.: *See*—
Balaban, Alvin R.; and Steckler, Steven A., 4,464,675, Cl. 358-31.000.
Steer, David C.: *See*—
Cox, Roger B.; and Steer, David C., 4,464,410, Cl. 426-573.000.
Steeves, John K., Jr., to Tele-Lite, Inc. Lamp head bracket mount for generator. 4,464,706, Cl. 362-193.000.
Steinberger, Helmut: *See*—
Alberts, Heinrich; Steinberger, Helmut; and Kortmann, Wilfried, 4,464,506, Cl. 524-588.000.
Steinel GmbH & Co. K.G.: *See*—
Siwon, Hans, 4,463,877, Cl. 222-146.0HE.
Steinle, Benedikt: *See*—
Lienhard, Heinz; Petr, Jan; and Steinle, Benedikt, 4,464,625, Cl. 324-117.00R.
Stellram GmbH: *See*—
Dehn, Dieter, 4,464,088, Cl. 408-182.000.
Stellram S.A.: *See*—
Muller, Jean-Marc, 4,464,087, Cl. 407-113.000.
Stenerhag, Bo; and Wirsen, Lars E., to ASEA Aktiebolag. Power capacitor. 4,464,700, Cl. 361-307.000.
Stenzel, Gerhard: *See*—
Kaule, Wittich; Schwenk, Gerhard; and Stenzel, Gerhard, 4,463,970, Cl. 283-72.000.
Sternberg, Stanley R.; Lougheed, Robert M.; and Dargel, William O., to Environmental Research Institute of Michigan. Dynamic data correction generator for an image analyzer system. 4,464,788, Cl. 382-41.000.
Sternberg, Stanley R., to Environmental Research Institute of Michigan. Image analyzer for processing multiple frames of image data. 4,464,789, Cl. 382-48.000.
Stevens, Phillip E.: *See*—
Long, John D.; and Stevens, Phillip E., 4,463,813, Cl. 172-705.000.
Stewart, Raymond A.: *See*—
Singer, Ronald E.; and Stewart, Raymond A., 4,463,529, Cl. 52-169.500.
Stewart, Roger G.; and Dingwall, Andrew G. F., to RCA Corporation. Memory system with redundancy for error avoidance. 4,464,754, Cl. 371-51.000.
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Stobb, Inc.: *See*—
Schlough, James R., 4,463,941, Cl. 270-54.000.
Stoddard, Nyle S.; and Butters, Scott W., to Terra Tek Core Services, Inc. Rock core test unit vibrator. 4,463,602, Cl. 73-153.000.
Stoddard, Ronald L. Trailer towing and steering system. 4,463,966, Cl. 280-442.000.
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C., to In Situ Technology, Inc. Minimizing subsidence effects during production of coal in situ. 4,463,807, Cl. 166-285.000.
Stoesser, Paul R.; Cuzic, John E.; and McLaren, John W., to Dow Chemical Company, The. Foam-generating pump sprayer. 4,463,905, Cl. 239-329.000.
Stojek, Dieter; and Weigmann, Gerhard, to Ford Motor Company. Device for varying the valve timing of internal combustion engines in correlation to load and speed. 4,463,712, Cl. 123-90.170.
Stoltman, Donald D., to General Motors Corporation. Dual fuel supply system. 4,463,735, Cl. 123-525.000.
Stone, James L., to Packaging Corporation of America. Article carrier. 4,463,852, Cl. 206-427.000.
Storage Technology Corporation: *See*—
Reilly, Charles; Laub, Leonard; and Swaminathan, Krishna, 4,464,567, Cl. 250-204.000.
Stranko, Thomas A.; and Swann, Robert L., to International Business Machines Corp. Machine check coordination. 4,464,751, Cl. 371-29.000.
Strasser, Andy, to General Mills Products Corp. Theft-preventive jewelry display stand. 4,463,856, Cl. 211-163.000.
Strehler, Hugo; Kegel, Robert; Valentin, Guenter; and Hoerauf, Werner, to BASF Aktiengesellschaft. Removal of caprolactam and its oligomers from cooling water containing these compounds. 4,464,266, Cl. 210-703.000.
Strobel, Stephen J.: *See*—
Berg, Peter G.; and Strobel, Stephen J., 4,463,737, Cl. 123-549.000.
Strom, Ulrich: *See*—
Wolf, Stuart A.; Strom, Ulrich; and Weiser, Kurt, 4,464,065, Cl. 374-121.000.
Stroman, David W.: *See*—
Argoudelis, Alexander D.; and Stroman, David W., 4,464,466, Cl. 435-92.000.
Strutz, Carl: *See*—
Rudolph, Rome R., deceased; Rudolph, Kathleen, executrix; Strutz, Carl; and Strutz, Frank C., 4,463,671, Cl. 101-35.000.
Strutz, Frank C.: *See*—
Rudolph, Rome R., deceased; Rudolph, Kathleen, executrix; Strutz, Carl; and Strutz, Frank C., 4,463,671, Cl. 101-35.000.
Sturtz, Georges; Pensec, Thierry; and Gautier, Jean-Claude, to Societe Nationale Elf Aquitaine (Production). Extraction of uranium with triphosphonic esters. 4,464,346, Cl. 423-10.000.
Suda, Kyo: *See*—
Takahashi, Kensaku; Yatsugake, Yasuo; Iwaya, Fukuo; Ito, Makoto; Takami, Katsumi; and Suda, Kyo, 4,464,011, Cl. 350-6.100.
Sudbeck, Rainer; and Baumgartner, Hans, to Pierburg GmbH & Co., KG. Method of generating gas pressure in an internal combustion engine, and apparatus for carrying out this method. 4,463,554, Cl. 60-274.000.
Suek, Edmond L.: *See*—
Murray, James G.; and Suek, Edmond L., 4,464,514, Cl. 525-238.000.
Sugimori, Masahiro: *See*—
Kishida, Kazuo; Hasegawa, Akira; and Sugimori, Masahiro, 4,464,513, Cl. 525-227.000.
Sugimoto, Nsohiko; Kojima, Tetsuro; and Mukunoki, Yasuo, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 4,464,462, Cl. 430-512.000.
Sugita, Naoki: *See*—
Isobe, Toshiaki; and Sugita, Naoki, 4,463,732, Cl. 123-492.000.
Sugiura, Hiroaki: *See*—
Yoshino, Yataro; Ota, Akiho; and Sugiura, Hiroaki, 4,464,328, Cl. 264-521.000.
Sugiura, Masaaki, to Agency of Industrial Science and Technology. Membrane for concentrating amino acids and process for concentrating amino acids. 4,464,498, Cl. 524-145.000.
Sugo, Yasuhisa: *See*—
Toyoda, Kazuhiro; Sugo, Yasuhisa; and Yamada, Katuyuki, 4,464,735, Cl. 365-190.000.
Suhadolnik, Robert J.; Wu, Joseph M.; Doetsch, Paul; and Henderson, Earl E., to Research Corporation. (2'-5')-Oligo (3'-deoxyadenylate) and derivatives thereof. 4,464,359, Cl. 424-180.000.
Sullivan, George D.: *See*—
Meenan, William C.; and Sullivan, George D., 4,463,691, Cl. 110-346.000.
Sulzer Brothers, Ltd.: *See*—
Binninger, August; and Kieliger, Josef, 4,463,781, Cl. 139-1.00E.
Sumino, Fumio: *See*—
Kajita, Isamu; and Sumino, Fumio, 4,464,449, Cl. 430-54.000.
Sumitomo Chemical Company, Limited: *See*—
Atsumi, Toshio; Tarumi, Yuzo; Sanjiki, Tetsutaro; Takebayashi, Yoshiaki; and Yoshida, Noboru, 4,464,531, Cl. 536-17.400.
Kawakami, Shigenao; Saka, Terumasa; Ura, Shigeru; Iwata, Mikio; Tokugawa, Yoshiharu; and Jinno, Naoyoshi, 4,464,505, Cl. 524-512.000.
Omura, Takashi; Harada, Naoki; and Tezuka, Yasuo, 4,464,297, Cl. 260-185.000.
Sumitomo Metal Industries, Lt.: *See*—
Wakano, Shigeru; Sakoda, Akito; Fukui, Kunihiro; and Nishihara, Minoru, 4,464,232, Cl. 204-28.000.
Sumrell, Gene: *See*—
Bailey, August V.; Boudreaux, Gordon J.; and Sumrell, Gene, 4,464,392, Cl. 424-313.000.
Sun, Shan C., to Westinghouse Electric Corp. Protective relay system. 4,464,697, Cl. 361-64.000.
Sung, Rodney L.; and Zoleski, Benjamin H., to Texaco Inc. Polyoxyalkylene polyamine triazole complexes. 4,464,276, Cl. 252-42.700.
Sunouchi, Akio: *See*—
Fujino, Masahisa; Sunouchi, Akio; Konno, Tatsuo; and Suzuki, Ryuji, 4,464,033, Cl. 354-266.000.
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., to Richardson-Vicks, Inc. Analgesic and anti-inflammatory compositions comprising caffeine and methods of using same. 4,464,376, Cl. 424-253.000.
Surovikin, Vitaly F.; Antonenko, Vladimir F.; Babich, Gennady V.; Bobrik, Mikhail Y.; Korenyak, Nikolai K.; Novikov, Vasily V.; Voloshin, Gennady A.; Belyaev, Georgy A.; Gordeev, Alexandr V.; Gallyamov, Nail I.; and Krikunenko, Anatoly F. Aerodynamic apparatus for mixing components of a fuel mixture. 4,464,314, Cl. 261-79.00A.
Sussman, Scot W.: *See*—
Rastogi, Laxmi K.; and Sussman, Scot W., 4,464,111, Cl. 432-24.000.
Suter, Hans-Jorg: *See*—
Schwager, Anton; and Suter, Hans-Jorg, 4,464,620, Cl. 323-300.000.
Sutherland, Derek R.: *See*—
O'Callaghan, Cynthia H.; Ayres, Barry E.; Newall, Christopher E.; Livermore, David G. H.; and Sutherland, Derek R., 4,464,368, Cl. 424-246.000.
Sutter, Leroy V., Jr. Elongated chambers for use in combination with a transversely excited gas laser. 4,464,760, Cl. 372-38.000.

Suzuki, Hajime; and Mitsuya, Kinpei, to Seisakusho Kabushiki Kaisha Toyoda Jidoshokki. Method of inserting the weft in jet loom. 4,463,783, Cl. 139-435.000.

Suzuki, Hiroyuki; Andoh, Ikuhiro; and Watanabe, Kouji, to Fujitsu Limited. Electrical connector. 4,464,002, Cl. 339-97.00P.

Suzuki, Ryuji: *See*—
Fujino, Masahisa; Sunouchi, Akio; Konno, Tatsuo; and Suzuki, Ryuji, 4,464,033, Cl. 354-266.000.

Suzuki, Tatsuhiro: *See*—
Taguchi, Noriyuki; Fuzita, Tsuyoshi; Toda, Gyozo; Ishihara, Syoosaku; Kuroki, Takashi; and Suzuki, Tatsuhiro, 4,464,420, Cl. 427-96.000.

Suzuki, Tatsuo, to Terumo Corporation. Breathing circuit. 4,463,755, Cl. 128-204.180.

Suzuki, Yasoji; and Matsuo, Kenji, to Tokyo Shibaura Denki Kabushiki Kaisha. Complementary IGFET Schmitt trigger logic circuit having a variable bias voltage logic gate section. 4,464,587, Cl. 307-279.000.

Svanborg Eden, Catharina: *See*—
Leffler, Hakon; and Svanborg Eden, Catharina, 4,464,360, Cl. 424-180.000.

Swallert, Sven A., to NPI New Products Investment AB. Measuring device. 4,463,876, Cl. 222-94.000.

Swaminathan, Krishna: *See*—
Reilly, Charles; Laub, Leonard; and Swaminathan, Krishna, 4,464,567, Cl. 250-204.000.

Swann, Robert L.: *See*—
Stranko, Thomas A.; and Swann, Robert L., 4,464,751, Cl. 371-29.000.

Swansen, James E.: *See*—
Bourret, Steven C.; and Swansen, James E., 4,464,616, Cl. 318-696.000.

Sylvan, Richard: *See*—
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 4,463,644, Cl. 83-745.000.

Symons Corporation: *See*—
Schimmel, Vernon R., 4,463,925, Cl. 249-11.000.

Szabo, Lajos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Kreidl, Janos; Nemes, Andras; Farkas nee Kirjak, Maria; Visky, Gyorgy; and Czibula, Laszlo , 4,464,534, Cl. 546-51.000.
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Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Kreidl, Janos; Nemes, Andras; Farkas nee Kirjak, Maria; Visky, Gyorgy; and Czibula, Laszlo , to Richter Gedeon Vegyeszeti Gyar Rt. Process for the preparation of vincaminic acid esters. 4,464,334, Cl. 546-51.000.

Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Kreidl, Janos; Visky, Gyorgy; Nemes, Andras; Czibula, Laszlo ; and Farkas nee Kirjak, Maria, to Richter Gedeon Vegyeszeti Gyar Rt. Process for the preparation of eburnamonine derivatives. 4,464,535, Cl. 546-51.000.

T.I.M.E. Welding Gas Corporation: *See*—
Church, John G.; and Malone, Emerson G., 4,464,560, Cl. 219-137.420.

T&R Chemicals, Inc.: *See*—
Arias-Alvarez, Jose A., 4,464,357, Cl. 424-162.000.

T. Shibuya (Diesel Kiki Co., Ltd.): *See*—
Shibuya, Tsunenori, 4,464,101, Cl. 418-125.000.

Tabuchi, Takahisa: *See*—
Asari, Akira; Noyori, Tatsuhiko; Tabuchi, Takahisa; Masuda, Tsuneharu; and Mizoguchi, Masao, 4,463,589, Cl. 72-273.500.

Tacchi, Percy G. Relating to shower fittings. 4,463,899, Cl. 239-75.000.

Tack, Robert D.; Lewtas, Kenneth; and Brazier, John R., to Exxon Research & Engineering Co. Glycol ester flow improver additive for distillate fuels. 4,464,182, Cl. 44-62.000.

Tada, Satomi: *See*—
Kumasaka, Sadao; and Tada, Satomi, 4,463,951, Cl. 273-58.00A.

Taft, Phillip A., to Lucas Industries Public Limited Company. Booster assisted hydraulic master cylinders for vehicle braking systems. 4,463,562, Cl. 60-555.000.

Taguchi, Noriyuki; Fuzita, Tsuyoshi; Toda, Gyozo; Ishihara, Syoosaku; Kuroki, Takashi; and Suzuki, Tatsuhiro, to Hitachi, Ltd. Ceramic multilayer circuit board and a process for manufacturing the same. 4,464,420, Cl. 427-96.000.

Taig, Alistair G., to Bendix Corporation, The. Cable assembly. 4,463,843, Cl. 192-111.00A.

Taira, Tadaaki; Takehara, Junichiro; Kobayashi, Yasuo; and Ume, Kazuyoshi, to Nippon Kokan Kabushiki Kaisha. Clad steel pipe excellent in corrosion resistance and low-temperature toughness and method for manufacturing same. 4,464,209, Cl. 148-36.000.

Takadera, Ichiro: *See*—
Shinbori, Takeyoshi; Takadera, Ichiro; and Fukumura, Takeo, 4,463,936, Cl. 267-36.00A.

Takagi, Hiroyoshi, to Hitachi Maxell, Ltd. Magnetic recording tape cartridge. 4,463,918, Cl. 242-199.000.

Takahashi, Kensaku; Yatsugake, Yasuo; Iwaya, Fukuo; Ito, Makoto; Takami, Katsumi; and Suda, Kyo, to Hitachi, Ltd.; and Hitachi Electronics Engineering Co., Ltd. Light beam scanning apparatus and the method. 4,464,011, Cl. 350-6.100.

Takahashi, Takashi: *See*—
Fukuyama, Katsuhiro; Haruta, Masatoshi; and Takahashi, Takashi, 4,463,873, Cl. 221-12.000.

Takahashi, Toshikatsu: *See*—
Kanazawa, Yukio; Takahashi, Toshikatsu; and Ishitate, Yoshiyuki, 4,464,046, Cl. 355-57.000.

Takahashi, Yoshio; Ozawa, Takeo; Sakamoto, Ryuji; Kanari, Katsuhiko; and Kamimoto, Masayuki, to Agency of Industrial Science Technology, Ministry of International Trade & Industry. Heat storage medium for latent heat thermal energy storage unit. 4,463,799, Cl. 165-10.000.

Takami, Katsumi: *See*—
Takahashi, Kensaku; Yatsugake, Yasuo; Iwaya, Fukuo; Ito, Makoto; Takami, Katsumi; and Suda, Kyo, 4,464,011, Cl. 350-6.100.

Takara Co., Ltd.: *See*—
Wakase, Hiroshi, 4,463,831, Cl. 185-39.000.

Takara Kogyo Co., Ltd.: *See*—
Ueda, Yoshihiko, 4,464,255, Cl. 210-136.000.

Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,464,369, Cl. 424-246.000.

Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, to Fujisawa Pharmaceutical Co., Ltd. 7-Acylamino-3-cephem-4-carboxylic acid derivatives and pharmaceutical compositions. 4,464,369, Cl. 424-246.000.

Takayanagi, Shinji; Kato, Yoshitaka; Nanno, Kunio; Yasunaga, Osamu; Takeuchi, Osamu; Yamamoto, Ryozo; Iwai, Kazuhiro; and Kasai, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Rear suspension system for motor vehicles. 4,463,964, Cl. 280-284.000.

Takebayashi, Yoshiaki: *See*—
Atsumi, Toshio; Tarumi, Yuzo; Sanjiki, Tetsutaro; Takebayashi, Yoshiaki; and Yoshida, Noboru, 4,464,531, Cl. 536-17.400.

Takeda Chemical Industries, Ltd.: *See*—
Matsumura, Koichi; and Aono, Tetsuya, 4,464,530, Cl. 536-124.000.

Takeda Riken Kogyo Kabushiki Kaisha: *See*—
Nakamura, Masakazu, 4,464,656, Cl. 340-728.000.

Takehara, Junichiro: *See*—
Taira, Tadaaki; Takehara, Junichiro; Kobayashi, Yasuo; and Ume, Kazuyoshi, 4,464,209, Cl. 148-36.000.

Takei, Yukio; Yoshida, Masao; and Nishizawa, Rinzo, to Nippon Kayaku Kabushiki Kaisha. Intermediates of 7-alkoxycarboxyl-6,8-dimethyl-4-hydroxymethyl-1-phthalazone. 4,464,532, Cl. 544-237.000.

Takekawa, Nobuhiro: *See*—
Koumura, Noboru; Komatsu, Toshiyuki; Nakagawa, Katsumi; Takekawa, Nobuhiro; and Fujii, Motoharu, 4,464,043, Cl. 355-14.00C.

Takeuchi, Osamu: *See*—
Takayanagi, Shinji; Kato, Yoshitaka; Nanno, Kunio; Yasunaga, Osamu; Takeuchi, Osamu; Yamamoto, Ryozo; Iwai, Kazuhiro; and Kasai, Hiroshi, 4,463,964, Cl. 280-284.000.

Takeuchi, Yasuhito; and Yamaguchi, Keiki, to Yokogawa Hokushin Electric Corp. Ultrasound imaging system. 4,463,608, Cl. 73-606.000.

Takimae, Toyosaku. Electric curling-iron with spiral polygonal hair engaging edges. 4,464,562, Cl. 219-225.000.

Takita, Hitoshi; Mukaida, Yutaka; Noda, Sakuo; and Kobayashi, Hidetoshi, to Kureha Kagaku Kogyo Kabushiki Kaisha. 4-[N-(Hydroxybenzyl)aminomethyl]cyclohexane-1-carboxylic acid. 4,464,396, Cl. 424-319.000.

Takita, Nobuhiro: *See*—
Taniguchi, Hiroshi; Takita, Nobuhiro; Nomura, Norimasa; and Mizuta, Masaji, 4,464,036, Cl. 354-324.000.

Takizawa, Kazuyuki; Izumi, Takao; and Kodama, Makoto, to Sony Corporation. Record playing apparatus. 4,464,743, Cl. 369-75.200.

Talmadge, Paul C.; and Vergato, Joseph A., to Perkin-Elmer Corporation, The. Spectrophotometer. 4,464,051, Cl. 356-323.000.

Tamura, Hiroshi: *See*—
Nishikawa, Toshio; Tamura, Sadahiro; and Tamura, Hiroshi, 4,464,640, Cl. 333-202.000.

Tamura, Sadahiro: *See*—
Nishikawa, Toshio; Tamura, Sadahiro; and Tamura, Hiroshi, 4,464,640, Cl. 333-202.000.

Tanaka, Chiaki: *See*—
Fujikawa, Junichi; Mataki, Hiroshi; Tanaka, Chiaki; and Nakashima, Shinobu, 4,464,456, Cl. 430-281.000.

Tanaka, Hideo: *See*—
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Shiroi, Takashi; Sasaoka, Michio; and Saito, Norio, 4,464,237, Cl. 204-81.000.

Tanaka, Hiroyuki; and Yamaguchi, Tadashi, to Mitsuboshi Belting Ltd. Ribbed belt. 4,464,148, Cl. 474-167.000.

Tanaka, Kazuyoshi: *See*—
Kojima, Tadashi; Uchihama, Tetsuo; Tanaka, Kazuyoshi; Morozumi, Eiichi; Inoue, Kentaro; and Shito, Naomichi, 4,463,773, Cl. 137-38.000.

Tanaka, Minoru; Ishizuka, Takeshi; and Shima, Kenzo, to Hitachi, Ltd. Distributorless ignition system with surge absorbing means and apparatus therefor. 4,463,744, Cl. 123-643.000.

Tanaka, Shikei; and Matsui, Kunihiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Hall element device. 4,464,629, Cl. 330-6.000.

Tanaka, Toshinori: *See*—
Hamano, Isao; and Tanaka, Toshinori, 4,464,595, Cl. 310-154.000.

Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, to Fujitsu Ten Limited; and Toyota Jidosha Kogyo Kabushiki Kaisha. Cruise control system for automotive vehicle. 4,463,822, Cl. 180-177.000.

Taniguchi, Hiroshi; Takita, Nobuhiro; Nomura, Norimasa; and Mizuta, Masaji, to Dainippon Screen Seizo Kabushiki Kaisha. Method and apparatus for controlling activity of developing solution against blackening by using a test piece. 4,464,036, Cl. 354-324.000.

Taniguthi, Tatsuhito; Niwa, Yutaka; and Masumoto, Takashi, to Hitachi Metals, Ltd. Outside screw-and-yoke type valve. 4,463,777, Cl. 137-553.000.

Tanimoto, Kenji: *See*—
Etoh, Satoshi; Kobayashi, Junichi; and Tanimoto, Kenji, 4,464,682, Cl. 358-288.000.
Tanken Seiko Corp.: *See*—
Nagai, Yataro; and Imai, Yoshiro, 4,463,957, Cl. 277-34.000.
Tanouchi, Tadao; Kawamura, Masanori; Ajima, Akio; Mohri, Tetsuya; Hayashi, Masaki; Terashima, Hiroshi; Hirata, Fumio; and Morimura, Takeshi, to Ono Pharmaceutical Co., Ltd. Rhodanine derivatives, process for their preparation, and aldose reductase inhibitor containing the rhodanine derivatives as active ingredient. 4,464,382, Cl. 424-270.000.
Tansuwan, Chusak, to ACF Industries, Incorporated. Apparatus for controllably opening a carburetor choke valve. 4,463,723, Cl. 123-438.000.
Tao, Fan-Sheng, to Texaco Inc. Method for regenerating brine. 4,463,809, Cl. 166-303.000.
Tarkett AB: *See*—
LaBianca, Michael H.; and Smith, Thomas G., 4,464,423, Cl. 427-244.000.
Tartaglia, John A. Medical syringe. 4,464,173, Cl. 604-89.000.
Tarumi, Yuzo: *See*—
Atsumi, Toshio; Tarumi, Yuzo; Sanjiki, Tetsutaro; Takebayashi, Yoshiaki; and Yoshida, Noboru, 4,464,531, Cl. 536-17.400.
Tasset, Emmett L., to Dow Chemical Company, The. Process for making cationic starch. 4,464,528, Cl. 536-50.000.
Tateishi, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Amorphous alloy for magnetic head. 4,464,208, Cl. 148-31.550.
Tatematsu, Takeo, to Fujitsu Limited. Semiconductor memory device. 4,464,750, Cl. 371-21.000.
Taubert, Rainer; and Kerscher, Utto, to Chemische Fabrik Kalk GmbH. Flameproofing of thermoplastics, thermosetting polymers, textiles, and other flammable materials with antimony oxy compounds. 4,464,501, Cl. 524-410.000.
Taylor, Mark P.: *See*—
Beall, George H.; Chirino, Agustin M.; Chyung, Kenneth; Martin, Francis W.; and Taylor, Mark P., 4,464,475, Cl. 501-9.000.
TDK Electronics Co., Ltd.: *See*—
Hirabayashi, Kenji; and Azegami, Hitoshi, 4,464,433, Cl. 428-336.000.
Technicare Corporation: *See*—
Erker, Joseph W., 4,464,776, Cl. 378-010.000.
Tecnoma: *See*—
Ballu, Patrick J., 4,463,521, Cl. 47-1.500.
Teco, Inc.: *See*—
Johnson, Leonard L., 4,463,528, Cl. 52-114.000.
Tedder, Daniel W., to Georgia Tech Research Institute. Fractional distillation of C_2/C_3 Hydrocarbons at optimum pressures. 4,464,189, Cl. 62-24.000.
Teepak, Inc.: *See*—
Judd, Henry E.; Dowell, Arthur M., Jr.; and Rahma.i, Matiur, 4,463,778, Cl. 138-118.100.
Teetz, Wolfgang: *See*—
Berger, Rolf; Bonnen, Josef; Haffmans, Josef; Schafer, Max; Teetz, Wolfgang; and Gierse, Franzjosef, 4,463,692, Cl. 112-102.000.
Tegal Corp.: *See*—
Gorin, Georges J., 4,464,223, Cl. 156-643.000.
Tejima, Masayuki: *See*—
Ohta, Saburo; Nakamura, Shoji; Hayashi, Katsutake; Yomogida, Katsuyuki; Morohoshi, Hideo; Hirose, Seiichi; Uehara, Keiichi; Aizawa, Masanori; Sato, Yoshihisa; Ichikawa, Hideyuki; Tejima, Masayuki; and Togano, Seisaku, 4,464,290, Cl. 252-522.00R.
Tektronix, Inc.: *See*—
Barter, Archie M., 4,464,709, Cl. 363-16.000.
Tele-Lite, Inc.: *See*—
Steeves, John K., Jr., 4,464,706, Cl. 362-193.000.
Teledyne-Walterboro, a Divison of Teledyne Industries, Inc.: *See*—
Greene, William J., 4,464,559, Cl. 219-130.510.
Telefonaktiebolaget L M Ericsson: *See*—
Forsberg, Gunnar S.; and Ingre, Lars P., 4,464,769, Cl. 375-110.000.
Teletype Corporation: *See*—
Jacobs, Norman A.; and Madhav, Jagdish T., 4,464,681, Cl. 358-285.000.
Tepic, Slobodan, to Mann, Robert W.; and Macirowski, Thomas, a part interest to each. Method and apparatus for preparing and applying a two-component cement. 4,463,875, Cl. 222-82.000.
Terachi, Junichi: *See*—
Yamagata, Shinji; Hisatsune, Fumiyuki; Terachi, Junichi; and Yoshiyasu, Hajimu, 4,464,642, Cl. 335-201.000.
Terashima, Hiroshi: *See*—
Tanouchi, Tadao; Kawamura, Masanori; Ajima, Akio; Mohri, Tetsuya; Hayashi, Masaki; Terashima, Hiroshi; Hirata, Fumio; and Morimura, Takeshi, 4,464,382, Cl. 424-270.000.
Terra Tek Core Services, Inc.: *See*—
Stoddard, Nyle S.; and Butters, Scott W., 4,463,602, Cl. 73-153.000.
Terry, Ruel C.: *See*—
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C., 4,463,807, Cl. 166-285.000.
Terui, Nobuhiko; and Okabe, Nobuo, to Nippon Kogaku K.K. Motor-driven camera capable of automatic focus control. 4,464,037, Cl. 354-400.000.
Terumo Corporation: *See*—
Suzuki, Tatsuo, 4,463,755, Cl. 128-204.180.
Tetra Pak Developpement SA: *See*—
Ljungcrantz, Billy, 4,464,154, Cl. 493-87.000.
Tetra Pak International A.B.: *See*—
Holmstrom, Sven N. H., 4,464,156, Cl. 493-194.000.
Teuling, Dirk J. A., to U.S. Philips Corporation. Circuit arrangement for a picture display device for generating a sawtooth-shaped line deflection current. 4,464,612, Cl. 315-408.000.
Teuscher, Leon A., to Xerox Corporation. Multi-layer photoreceptor containing siloxane on a metal oxide layer. 4,464,450, Cl. 430-59.000.
Tex-Fab, Inc.: *See*—
Joyce, William R., 4,464,160, Cl. 493-448.000.
Texaco Inc.: *See*—
Rooney, Jack F.; Cooper, William K.; Papageorge, Stephen J.; and Christ, Eugene L., 4,463,804, Cl. 166-165.000.
Schievelbein, Vernon H., 4,464,268, Cl. 252-8.55B.
Sung, Rodney L.; and Zoleski, Benjamin H., 4,464,276, Cl. 252-42.700.
Tao, Fan-Sheng, 4,463,809, Cl. 166-303.000.
Zimmerman, Robert L.; and Peterson, Bruce W., 4,464,488, Cl. 521-115.000.
Texas Instruments Incorporated: *See*—
Berg, Peter G.; and Strobel, Stephen J., 4,463,737, Cl. 123-549.000.
McElroy, David J., 4,464,734, Cl. 365-51.000.
Scott, Warner C.; and Wiggins, Richard H., 4,464,118, Cl. 434-85.000.
Tezuka, Yasuo: *See*—
Omura, Takashi; Harada, Naoki; and Tezuka, Yasuo, 4,464,297, Cl. 260-185.000.
Thacker, Milton B., to Standard Oil Company (Indiana). Horizontal fluid bed retorting process. 4,464,247, Cl. 208-11.00R.
Thaler, Hartmuth F. Solderless connector pin for electrical circuits. 4,464,009, Cl. 339-252.00R.
Thelen, William, to AT&T Laboratories. Multipoint data communication system with collision detection. 4,464,658, Cl. 340-825.500.
Theobald, Donald L., to Harris-Thomas Drop Forge Company, The. Forging method. 4,463,590, Cl. 72-354.000.
Thery, Jean-Pierre: *See*—
Durrieu, Marc M.; and Thery, Jean-Pierre, 4,464,057, Cl. 366-139.000.
Thiele, Dietrich, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Process for the stabilization of radioactive wastes. 4,464,294, Cl. 252-629.000.
Thiele, Willi: *See*—
Leckband, Uwe; Thiele, Willi; Hagenah, Klaus; and Forster, Hans, 4,463,769, Cl. 131-109.0AB.
Thies, Curt; and Linek, Francis W., to Washington University, The. Method of encapsulating active agents with inorganic coatings. 4,464,317, Cl. 264-4.300.
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Le Berre, Serge; Hareng, Michel; Beguin, Annie; and Thirant, Lydie, 4,464,020, Cl. 350-350.00S.
Thoma, Fritz, to Dieter Graesslin Feinwerktechnik. Milti-range cycle control timer unit. 4,463,617, Cl. 74-3.500.
Thomas, Daniel: *See*—
Avrameas, Stratis; Broun, Georges; Selegny, Eric; and Thomas, Daniel, 4,464,468, Cl. 435-177.000.
Thomas, David E.; Jeffrey, David M.; and Simms, David W., to Sangamo Weston Limited. Mounting structure for dial and pointer electrical instruments. 4,464,626, Cl. 324-156.000.
Thomas, Lowell S.; and Paige, William P., to Dow Chemical Company, The. Process for preparing additive concentrates for carbonate polymers. 4,464,487, Cl. 521-90.000.
Thomas, Robert C. Can crusher. 4,463,670, Cl. 100-45.000.
Thome, Gopal: *See*—
Thome, Paul; and Thome, Gopal, 4,463,609, Cl. 73-637.000.
Thome, Paul; and Thome, Gopal. Method and apparatus for testing the soundness of the welds of off-shore structures during service. 4,463,609, Cl. 73-637.000.
Thompson, Charles R., to RCA Corporation. Digital recording of television components with improved transition spacing. 4,464,683, Cl. 358-310.000.
Thompson, David J.: *See*—
Harrison, Kenneth J.; Raynes, Edward P.; Saunders, Frances C.; and Thompson, David J., 4,464,282, Cl. 252-299.100.
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Baron, George B.; and Thompson, George J., 4,464,093, Cl. 414-687.000.
Thompson, Harold. Methods and apparatus for treating smoking articles. 4,463,770, Cl. 131-329.000.
Thompson, William L., to Babcock & Wilcox Company, The. Electronic circuit using digital techniques for vortex shedding flowmeter signal processing. 4,463,612, Cl. 73-861.220.
Thomson-Brandt: *See*—
Metz, Pierre, 4,463,921, Cl. 244-3.220.
Thomson-CSF: *See*—
Baudoin, Michel; Carru, Jean-Pierre; and Veislinger, Yves, 4,464,542, Cl. 179-2.00C.
Le Berre, Serge; Hareng, Michel; Beguin, Annie; and Thirant, Lydie, 4,464,020, Cl. 350-350.00S.
Thornton, Leif N., to Augat Inc. Cleaving tool for optical fibers. 4,463,886, Cl. 225-96.500.
Thuc, Tran N., to Senko Medical Instrument Mfg., Co., Ltd. Ventilation apparatus for artificial respiration. 4,463,756, Cl. 128-204.210.
Thurner, Hans, to Bayerisches Druckguss-Werk Thurner KG. Vacuum die casting machine. 4,463,793, Cl. 164-155.000.
Timofeev, Alexandr N.: *See*—
Korshunov, Evgeny A.; Kuznetsov, Alexandr N.; Ovodenko, Maxim B.; Kuzmin, Gennady G.; Kostrov, Valery P.; Timofeev, Alexandr N.; Bastrikov, Valery L.; and Meschaninova, Tatyana V., 4,463,796, Cl. 164-460.000.

Tobita, Chuo: *See*—
Minato, Yoshiharu; and Tobita, Chuo, 4,463,642, Cl. 83-530.000.
Toda, Gyozo: *See*—
Taguchi, Noriyuki; Fuzita, Tsuyoshi; Toda, Gyozo; Ishihara, Syoosaku; Kuroki, Takashi; and Suzuki, Tatsuhiro, 4,464,420, Cl. 427-96.000.
Togano, Seisaku: *See*—
Ohta, Saburo; Nakamura, Shoji; Hayashi, Katsutake; Yomogida, Katsuyuki; Morohoshi, Hideo; Hirose, Seiichi; Uehara, Keiichi; Aizawa, Masanori; Sato, Yoshihisa; Ichikawa, Hideyuki; Tejima, Masayuki; and Togano, Seisaku, 4,464,290, Cl. 252-522.00R.
Tojo, Kenji: *See*—
Machida, Shigeru; Tojo, Kenji; Ikegawa, Masato; and Shiibayashi, Masao, 4,464,100, Cl. 418-55.000.
Tokico Ltd.: *See*—
Ashiba, Masahiro, 4,463,839, Cl. 188-299.000.
Tokuda, Akira: *See*—
Fukaya, Kastuyoshi; Tokuda, Akira; and Hirano, Hitoshi, 4,463,724, Cl. 123-438.000.
Tokugawa, Yoshiharu: *See*—
Kawakami, Shigenao; Saka, Terumasa; Ura, Shigeru; Iwata, Mikio; Tokugawa, Yoshiharu; and Jinno, Naoyoshi, 4,464,505, Cl. 524-512.000.
Tokushima, Tadao, to Nippon Gakki Seizo Kabushiki Kaisha. Waveform producing system employing scanning of a waveform pattern. 4,463,649, Cl. 84-1.180.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Fukuyama, Katsuhiro; Haruta, Masatoshi; and Takahashi, Takashi, 4,463,873, Cl. 221-12.000.
Machida, Kaoru, 4,464,777, Cl. 378-146.000.
Maeguchi, Kenji, 4,463,492, Cl. 29-576.00B.
Masui, Michio; Ogawa, Yasuhiro; and Esumi, Kunio, 4,464,696, Cl. 361-42.000.
Matsuyama, Kouzou, 4,464,044, Cl. 355-14.00R.
Momose, Hiroshi, 4,463,493, Cl. 29-576.00B.
Moriyasu, Toshinori; and Nakai, Masanori, 4,464,589, Cl. 307-477.000.
Nishito, Akihiro; Ohtombe, Ko; Yamakawa, Susumu; and Nakamura, Yasushi, 4,464,786, Cl. 382-7.000.
Sawazaki, Norikazu; and Chiba, Shu, 4,464,691, Cl. 360-111.000.
Seki, Nagataka, 4,464,585, Cl. 307-252.00C.
Sekiya, Kunihiko; Mizuguchi, Mamoru; and Ohzeki, Takashi, 4,464,669, Cl. 346-76.0PH.
Suzuki, Yasoji; and Matsuo, Kenji, 4,464,587, Cl. 307-279.000.
Tanaka, Shikei; and Matsui, Kunihiko, 4,464,629, Cl. 330-6.000.
Tateishi, Hiroshi, 4,464,208, Cl. 148-31.550.
Watanabe, Yoshihiro, 4,463,939, Cl. 270-1.100.
Yamagishi, Yoshio, 4,464,775, Cl. 378-5.000.
Yamanaka, Junichi, 4,464,680, Cl. 358-218.000.
Yoshihisa, Kozo; and Okui, Isamu, 4,464,632, Cl. 330-254.000.
Tom McGuane Industries, Inc.: *See*—
Detweiler, Charles A., 4,463,716, Cl. 123-198.0DB.
Detweiler, Charles A., 4,464,310, Cl. 261-39.00E.
Tomasi, Jean-Pierre, to U.S. Philips Corporation. Determining azimuth of a transponder by measuring a plurality of phase shifts. 4,464,662, Cl. 343-16.00R.
Tomino, Naoki, to Nippon Kogaku K.K. Device for electrically connecting lens and camera. 4,464,034, Cl. 354-286.000.
Tomioka, Kenichi: *See*—
Murase, Kiyoshi; Mase, Toshiyasu; Arima, Hideki; Niigata, Kunihiro; Tomioka, Kenichi; and Kobayashi, Shinichiro, 4,464,384, Cl. 424-270.000.
Tomita, Masahiro; and Tsukao, Toshiyuki, to Nippon Soken, Inc. Exhaust gas filter. 4,464,185, Cl. 55-310.000.
Tomiyasu, Kunihiko: *See*—
Ueno, Ryuzo; Kanayama, Tatsuo; Tomiyasu, Kunihiko; Fujikami, Asao; and Nakashima, Toshitaka, 4,464,404, Cl. 426-332.000.
Tomono, Makoto: *See*—
Haneda, Satoshi; Ito, Takashi; Nakamura, Ken; and Tomono, Makoto, 4,464,041, Cl. 355-3.0DD.
Tompa, Thomas J.: *See*—
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Hudson, Wilbur G.; Webb, Tommy W.; Phillips, William S.; Tompa, Thomas J.; and Sanders, Edward, Jr., 4,463,669, Cl. 100-43.000.
Tomy Kogyo Company, Inc.: *See*—
Nagai, Yoshitoshi, 4,463,514, Cl. 446-294.000.
Toner, Stephen J.: *See*—
Amend, William E.; and Toner, Stephen J., 4,463,567, Cl. 60-671.000.
Tong, George L.: *See*—
Mosher, Carol W.; Tong, George L.; and Acton, Edward M., 4,464,529, Cl. 536-6.400.
Tonne, Peter; and Jaedicke, Hagen, to BASF Aktiengesellschaft. Preparation of saccharin. 4,464,537, Cl. 548-211.000.
Tooson, Ronald: *See*—
Maher, Robert J.; and Tooson, Ronald, 4,464,047, Cl. 355-93.000.
Tootle, James N.; and Martin, Eugene J., to Pneumo Corporation. Fluid actuator with sequence-power valve. 4,463,657, Cl. 91-44.000.
Tootle, James N., to Pneumo Corporation. Fluid actuator with remote lock release assembly. 4,463,661, Cl. 92-17.000.
Topolcai, Laszlone I.: *See*—
Czvikovszky, Tibor J.; Pazonyi, Tamas; Topolcai, Laszlone I.; and Kleban, Janos, 4,464,510, Cl. 525-54.230.
Toray Industries, Inc.: *See*—
Fujikawa, Junichi; Mataki, Hiroshi; Tanaka, Chiaki; and Nakashima, Shinobu, 4,464,456, Cl. 430-281.000.
Hisaki, Hisao; Nagashima, Junnosuke; and Kanno, Katsuo, 4,464,431, Cl. 428-266.000.
Kajita, Koji; Nakayama, Takashi; and Yamagata, Seiichi, 4,463,549, Cl. 57-328.000.
Torbiaa, Ivar: *See*—
Berg, Terie; Hubertz, Trond; Kleiven, Erland; and Torbiaa, Ivar, 4,463,987, Cl. 299-2.000.
Torelli, Vesperto: *See*—
Nedelec, Lucien; and Torelli, Vesperto, 4,464,302, Cl. 260-397.100.
Torii, Sigeru; Tanaka, Hideo; Nokami, Junzo; Shiroi, Takashi; Sasaoka, Michio; and Saito, Norio, to Otsuka Kagaku Yakuhin Kabushiki Kaisha. Process for preparing β-lactam derivatives. 4,464,237, Cl. 204-81.000.
Toriyama, Kazuhisa: *See*—
Hasegawa, Shinji; Toriyama, Kazuhisa; Pohl, Ludwig; and Weber, Georg, 4,464,283, Cl. 252-299.630.
Toto, Ltd.: *See*—
Kishima, Noboru; Ueda, Yoshio; and Sato, Takeshi, 4,464,485, Cl. 521-64.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Imagawa, Noriyuki; and Utsunomiya, Nobu, 4,463,863, Cl. 215-343.000.
Toyoda, Kazuhiro; Sugo, Yasuhisa; and Yamada, Katuyuki, to Fujitsu Limited. Semiconductor memory. 4,464,735, Cl. 365-190.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Kobayashi, Tatsuo, 4,463,722, Cl. 123-425.000.
Matsuoka, Hiroki, 4,463,731, Cl. 123-492.000.
Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Ota, Yozo; and Morino, Toshiharu, 4,464,311, Cl. 261-44.00C.
Shinoda, Kazuo, 4,463,741, Cl. 123-571.000.
Ueno, Makoto, 4,463,717, Cl. 123-198.00F.
Umemoto, Yoshiro; Sanmiya, Tsugumi; and Kato, Mituo, 4,464,499, Cl. 524-230.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Isobe, Toshiaki; and Sugita, Naoki, 4,463,732, Cl. 123-492.000.
Tanigawa, Kou; Masuda, Jiro; Nakamura, Kazumasa; and Hayashi, Kazuhiko, 4,463,822, Cl. 180-177.000.
Yoshimi, Akiro; Kuwajima, Takeshi; Ootsuka, Fumio; and Matsushima, Takeo, 4,463,801, Cl. 165-43.000.
Tranin, Jean-Piere; and Labourdete, Jean-Louis, to U.S. Philips Corporation. Procedure of igniting an explosive device and explosive device thus obtained. 4,463,681, Cl. 102-424.000.
Trans Texas Energy, Inc.: *See*—
Wyatt, William G., 4,463,803, Cl. 166-59.000.
Transamerica Delaval Inc.: *See*—
Amend, William E.; and Toner, Stephen J., 4,463,567, Cl. 60-671.000.
Trissel, Paul E.: *See*—
Burnett, Dale E.; Butts, Mervin R.; and Trissel, Paul E., 4,463,576, Cl. 62-228.300.
Tromborg, Erik T., to Honeywell Inc. System for error detection in frequency shift keyed signals. 4,464,756, Cl. 371-63.000.
Trousdell, Edmund D.; and Voyer, Peter E., to United Technologies Corporation. Self-actuating rotor seal. 4,464,096, Cl. 416-215.000.
Troutner, Vernon H.; and Morrow, Richard A., to Extracorporeal Medical Specialties, Inc. Flowrate control for a blood flow system. 4,464,164, Cl. 604-5.000.
Trube & Kings KG: *See*—
Breithaupt, Albert, 4,463,530, Cl. 52-171.000.
TRW Inc.: *See*—
Gerken, John M., 4,464,094, Cl. 415-217.000.
Tsai, Boh C.: *See*—
Farrell, Christopher J.; Tsai, Boh C.; and Wachtel, James A., 4,464,443, Cl. 428-688.000.
Tsai, Edward S., to Deere & Company. Closed loop fuel injection timing control. 4,463,733, Cl. 123-501.000.
Tsang, Won-Tien, to AT&T Bell Laboratories. Molecular beam epitaxy apparatus for handling phosphorus. 4,464,342, Cl. 422-247.000.
Tsang, Won-Tien: *See*—
Logan, Ralph A.; and Tsang, Won-Tien, 4,464,211, Cl. 148-171.000.
Tseung, Alfred C. C.; Rasiyah, Nagendra P.; and Hibbert, David B. Electrocatalyst. 4,464,239, Cl. 204-129.000.
Tsuboi, Masaharu, to Honda Giken Kogyo Kabushiki Kaisha. Power transmission unit for a motorcycle. 4,463,823, Cl. 180-226.000.
Tsubone, Masahiro; and Machida, Bon, to Sekisui Kaseihin Kogyo Kabushiki Kaisha. Sheet for forming sleeve and process for producing the same. 4,463,861, Cl. 215-12.00R.
Tsuchie, Osamu. Method of making kits for carving reproduction. 4,464,214, Cl. 156-61.000.
Tsuchiya, Hiroshi: *See*—
Omori, Kazuo; Tsuchiya, Hiroshi; Yamazaki, Yoshio; and Inowa, Shigeru, 4,464,042, Cl. 355-3.0SH.
Tsugeno, Makoto: *See*—
Ozawa, Kiyomi; Nakajima, Yasuyuki; Tsugeno, Makoto; Ishii, Shigeru; and Hatanaka, Masataka, 4,464,386, Cl. 424-273.00P.
Tsuji, Kiyoshi: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,464,369, Cl. 424-246.000.
Tsukada, Takami: *See*—
Yoshino, Yataro; Tsukada, Takami; Saito, Tadao; and Nozawa, Takamitsu, 4,463,860, Cl. 215-12.00R.

Tsukao, Toshiyuki: *See*—
Tomita, Masahiro; and Tsukao, Toshiyuki, 4,464,185, Cl. 55-310.000.
Tsunekawa, Tokuichi: *See*—
Nakamura, Zenzo; Uchiyama, Takashi; Ohtaki, Shohei; Tsunekawa, Tokuichi; Uchidoi, Masanori; and Mashimo, Yukio, 4,464,609, Cl. 315-241.00P.
Tuovinen, Frans H.; Norrman, Bengt F.; Heikkila, Risto M.; and Honkaniemi, Matti E., to Outokumpu Oy. Device for moving solid material fed onto the surface of a melt and for breaking a slag crust formed on the surface of the melt or inside the charge. 4,464,764, Cl. 373-87.000.
Turbak, Albin F.; Snyder, Fred W.; and Sandberg, Karen R., to International Telephone and Telegraph Corporation. Suspensions containing microfibrillated cellulose. 4,464,287, Cl. 252-312.000.
Turkin, Vladimir Y.: *See*—
Ivanov, Nikolai A.; Ivanov, Boris G.; Zagoratsky, Leonid P.; Mitrofanov, Evgeny S.; Cherkassky, Vladimir A.; Finkelshtein, Georgy A.; Blekhman, Ilya I.; Barzukov, Oleg P.; Kaljunov, Gennady A.; Khinich, Isaak Y.; and Turkin, Vladimir Y., 4,463,908, Cl. 241-207.000.
Turnbaugh, Kenneth B.: *See*—
Cusack, Michael D.; and Turnbaugh, Kenneth B., 4,463,892, Cl. 228-212.000.
Turner, John P. Chain-saw chain sharpening device. 4,463,630, Cl. 76-25.00A.
Tycon S.p.A.: *See*—
Cappuccilli, Giorgio, 4,464,066, Cl. 374-141.000.
Tyszkiewicz, Theodore J.: *See*—
Boden, Richard M.; Tyszkiewicz, Theodore J.; and Watkins, Hugh, 4,464,280, Cl. 252-174.110.
Ube Industries Ltd.: *See*—
Kobayashi, Shinsaku; Kamoshita, Katsuo; Nagai, Shigeki; Honda, Takeo; Oda, Kiroku; Fujii, Katsutoshi; Kobayashi, Takashi; and Kojima, Mikio, 4,464,375, Cl. 424-251.000.
Uchida, Masaaki; and Isitani, Shigeo, to Nissan Motor Company, Limited. Oxygen sensing device having solid electrolyte cell and means for supplying controlled current thereto. 4,464,244, Cl. 204-425.000.
Uchida, Tadahiro; Wakita, Hiizu; and Hara, Mizoru, to Kabushiki Kaisha Kubota Seisakusho. Safety device for centrifugal separators. 4,464,161, Cl. 494-7.000.
Uchidoi, Masanori: *See*—
Kiuchi, Masayoshi; Uchidoi, Masanori; and Urushihara, Kazunobu, 4,464,032, Cl. 354-234.100.
Nakamura, Zenzo; Uchiyama, Takashi; Ohtaki, Shohei; Tsunekawa, Tokuichi; Uchidoi, Masanori; and Mashimo, Yukio, 4,464,609, Cl. 315-241.00P.
Uchihama, Tetsuo: *See*—
Kojima, Tadashi; Uchihama, Tetsuo; Tanaka, Kazuyoshi; Morozumi, Eiichi; Inoue, Kentaro; and Shito, Naomichi, 4,463,773, Cl. 137-38.000.
Uchiyama, Takashi: *See*—
Nakamura, Zenzo; Uchiyama, Takashi; Ohtaki, Shohei; Tsunekawa, Tokuichi; Uchidoi, Masanori; and Mashimo, Yukio, 4,464,609, Cl. 315-241.00P.
Ueda, Shiro. Clamp regulator for transfusing liquid and blood. 4,463,928, Cl. 251-6.000.
Ueda, Yoshihiko, to Takara Kogyo Co., Ltd. Water purification device. 4,464,255, Cl. 210-136.000.
Ueda, Yoshio: *See*—
Kishima, Noboru; Ueda, Yoshio; and Sato, Takeshi, 4,464,485, Cl. 521-64.000.
Uehara, Keiichi: *See*—
Ohta, Saburo; Nakamura, Shoji; Hayashi, Katsutake; Yomogida, Katsuyuki; Morohoshi, Hideo; Hirose, Seiichi; Uehara, Keiichi; Aizawa, Masanori; Sato, Yoshihisa; Ichikawa, Hideyuki; Tejima, Masayuki; and Togano, Seisaku, 4,464,290, Cl. 252-522.00R.
Ueno Fine Chemicals Industry, Ltd.: *See*—
Ueno, Ryuzo; Kanayama, Tatsuo; Tomiyasu, Kunihiko; Fujikami, Asao; and Nakashima, Toshitaka, 4,464,404, Cl. 426-332.000.
Ueno, Kenji: *See*—
Ushioda, Minoru; Ueno, Kenji; and Kobayashi, Masahiro, 4,464,503, Cl. 524-425.000.
Ueno, Makoto, to Toyota Jidosha Kabushiki Kaisha. Valve stopping device of internal combustion engine. 4,463,717, Cl. 123-198.00F.
Ueno, Ryuzo; Kanayama, Tatsuo; Tomiyasu, Kunihiko; Fujikami, Asao; and Nakashima, Toshitaka, to Ueno Fine Chemicals Industry, Ltd. Processes for production of refrigerated minced fish flesh and fish paste product having improved quality. 4,464,404, Cl. 426-332.000.
Uibel, Paul-Ulrich, to Vorwerk & Co Interholding GmbH. Device for mounting a lid on a housing of a vacuum cleaner. 4,463,472, Cl. 15-327.00F.
Ultra-Mold Corporation: *See*—
Bressler, Glenn O.; and Godshalk, James B., 4,463,705, Cl. 119-45.00R.
Ulug, Mehmet E., to General Electric Company. Bi-directional token flow system. 4,464,749, Cl. 370-85.000.
Ume, Kazuyoshi: *See*—
Taira, Tadaaki; Takehara, Junichiro; Kobayashi, Yasuo; and Ume, Kazuyoshi, 4,464,209, Cl. 148-36.000.
Umemoto, Yoshiro; Sanmiya, Tsugumi; and Kato, Mituo, to Toyota Jidosha Kabushiki Kaisha; and Sanko Chemical Co., Ltd. Wax for low gloss resin exterior parts of an automobile. 4,464,499, Cl. 524-230.000.
Unger Enterprises, Inc.: *See*—
Vorobyov, Michael, 4,464,078, Cl. 403-351.000.
Union Carbide Corporation: *See*—
Anthony, John, 4,464,426, Cl. 428-35.000.
Union Siderurgique Du Nord Et De L'Est De La France: *See*—
Germain, Alfred; and Roth, Bernard, 4,463,771, Cl. 134-122.00R.
Union Special Corporation: *See*—
Steckenrider, Paul E., 4,463,696, Cl. 112-200.000.
Uniroyal, Inc.: *See*—
Jacobs, Martin I., 4,464,502, Cl. 524-411.000.
Nemzek, Thomas L.; and Geelan, Brendan J., 4,464,496, Cl. 524-91.000.
Uniroyal Ltd.: *See*—
Brewer, Arthur D., 4,464,538, Cl. 549-20.000.
Unisearch Limited: *See*—
Dalglish, Robert L., 4,464,573, Cl. 250-396.00R.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defense in Her Britannic Majesty's Government of the: *See*—
Mullin, John B.; Holliday, Arthur K.; Cole-Hamilton, David J.; and Jones, Anthony C., 4,464,233, Cl. 204-59.0QM.
United States Gypsum Company: *See*—
Green, William J.; and Semmerling, Ralph P., 4,464,074, Cl. 403-192.000.
Wendt, Alan C., 4,463,535, Cl. 52-397.000.
United States of America
Agriculture: *See*—
Bailey, August V.; Boudreaux, Gordon J.; and Sumrell, Gene, 4,464,392, Cl. 424-313.000.
Bhaduri, Saumya; and Demchick, Paul H., 4,464,295, Cl. 260-112.00R.
Jacks, Thomas J.; Hensarling, Thomas P.; and Muller, Linda L., 4,464,296, Cl. 260-123.500.
Kochansky, Jan; and Wright, Fred C., 4,464,390, Cl. 424-300.000.
Air Force: *See*—
Miller, Gordon W.; and McClintock, Larry L., 4,464,702, Cl. 361-328.000.
Army: *See*—
Murphy, Joseph, 4,464,602, Cl. 313-509.000.
Sayles, David C., 4,463,680, Cl. 102-363.000.
Commerce: *See*—
Kissam, Allan D., 4,464,401, Cl. 426-238.000.
Energy: *See*—
Adams, Johnnie E.; and Jamieson, Donald R., 4,464,520, Cl. 526-262.000.
Bourret, Steven C.; and Swansen, James E., 4,464,616, Cl. 318-696.000.
Hirschfeld, Tomas B., 4,464,572, Cl. 250-338.000.
Liepins, Raimond, 4,464,416, Cl. 427-40.000.
Minh, Nguyen Q.; Loutfy, Raouf O.; and Yao, Neng-Ping, 4,464,234, Cl. 204-67.000.
Murphy, James T.; and Miller, John R., 4,464,413, Cl. 427-6.000.
Pace, Marshall O.; Adcock, James L.; and Christophorou, Loucas G., 4,464,417, Cl. 427-41.000.
Sopori, Bhushan L.; and Wolf, Abraham, 4,463,927, Cl. 249-95.000.
Speir, Leslie G.; and Adams, Edwin L., 4,464,330, Cl. 376-159.000.
Yeh, Hsu-Chi; and Cheng, Yung-Sung, 4,463,595, Cl. 73-28.000.
Young, Thomas M., 4,463,547, Cl. 57-6.000.
Interior: *See*—
Dotson, Danny W.; Mikesell, Jon L.; and Senftle, Frank E., 4,464,338, Cl. 422-78.000.
National Aeronautics and Space Administration: *See*—
Barmatz, Martin B., 4,463,606, Cl. 73-505.000.
Gruber, Robert P., 4,464,710, Cl. 363-22.000.
Parker, John A.; and Kourtides, Demetrius A., 4,463,465, Cl. 5-459.000.
Navy: *See*—
Jablonski, Daniel G., 4,464,637, Cl. 330-426.000.
Lewis, Bernard L.; and Kretschmer, Frank F., Jr., 4,464,768, Cl. 375-101.000.
Moorcroft, Arthur L., 4,464,739, Cl. 367-130.000.
Nichols, James H., Jr.; Furey, Roger J.; Englar, Robert J.; and Lee, David G., 4,463,920, Cl. 244-207.000.
Pickett, David M.; Knutson, Richard K.; and VonFeldt, William, 4,463,701, Cl. 114-245.000.
Reich, Ronald S.; Held, Jimmy L.; Munson, Arthur E.; and Hartley, James R., 4,463,496, Cl. 30-180.000.
Weimer, Raymond J.; and Kim, Chulho, 4,463,678, Cl. 102-307.000.
Wolf, Stuart A.; Strom, Ulrich; and Weiser, Kurt, 4,464,065, Cl. 374-121.000.
U.S. Philips Corporation: *See*—
Compaan, Klaas, 4,464,741, Cl. 369-45.000.
Hanecka, Lubomir; and Hutter, Heinrich, 4,464,690, Cl. 360-84.000.
Huijser, Arie; Carasso, Marino G.; and Verboom, Johannes J., 4,464,714, Cl. 364-200.000.
Khoe, Giok D.; and Krahn, Friedrich, 4,464,012, Cl. 350-96.160.
Kommoss, Klaus; and Schutte, Valentin H., 4,464,695, Cl. 360-137.000.
Meershoek, Hans, 4,464,643, Cl. 335-213.000.
Misker, Jan S.; and de Vos, Jacobus A., 4,464,733, Cl. 364-900.000.
Monen, Marinus J. B. M., 4,464,757, Cl. 371-71.000.
Snijders, Wilfred A. M.; Kalfs, Johannes J. W.; and Van Gerwen, Petrus J., 4,464,746, Cl. 370-32.000.

Teuling, Dirk J. A., 4,464,612, Cl. 315-408.000.
Tomasi, Jean-Pierre, 4,464,662, Cl. 343-16.00R.
Tranin, Jean-Piere; and Labourdete, Jean-Louis, 4,463,681, Cl. 102-424.000.
Urner Wille, Marlies; and Hansen, Peter, 4,464,437, Cl. 428-458.000.
Von Osten, Reimer, 4,464,722, Cl. 364-551.000.
United States Steel Corporation: *See*—
Cera, Thomas J.; and Price, Charles A., 4,464,184, Cl. 55-21.000.
United Technologies Corporation: *See*—
Brown, Clyde O.; and Smith, David C., 4,464,021, Cl. 350-354.000.
Chenausky, Peter P.; Mongeon, Robert J.; and Laughman, Lanny M., 4,464,758, Cl. 372-11.000.
Eliason, Robbin D.; and Rotondo, Claude P., 4,463,994, Cl. 308-196.000.
Layden, George K.; and Prewo, Karl M., 4,464,192, Cl. 65-18.100.
Monhardt, Richard J.; Kudlacik, Louis; Nikkanen, John P.; and Niiler, Juri, 4,463,552, Cl. 60-226.100.
Trousdell, Edmund D.; and Voyer, Peter E., 4,464,096, Cl. 416-215.000.
Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co.: *See*—
Schimko, Reinhold; and Koninger, Josef, 4,463,577, Cl. 66-64.000.
Universal Maschinenfabrik Dr. Rudolf Schieber GmbH & Co. KG: *See*—
Schimko, Reinhold; Lutz, Albert; and Kuhnert, Gottfried, 4,463,578, Cl. 66-75.100.
Schimko, Reinhold; and Kuhnert, Gottfried, 4,463,579, Cl. 66-75.100.
University of Birmingham: *See*—
Hobbs, Donald A.; and Rowe, Geoffrey W., 4,463,600, Cl. 73-81.000.
University of California, The Regents of the: *See*—
Carbon, John A.; and Clarke, Louise B., 4,464,472, Cl. 435-255.000.
Hofmann, Alan F., 4,464,399, Cl. 424-342.000.
Hull, Maury L., 4,463,968, Cl. 280-612.000.
Kramer, Steven G.; and Yavitz, Edward Q., 4,463,880, Cl. 222-189.000.
Orser, Cindy S.; Lindow, Steven E.; Panopoulos, Nickolas J.; and Staskawicz, Brian J., 4,464,473, Cl. 435-172.300.
University of Cincinnati: *See*—
Armentrout, Richard W.; and Brown, Ronald D., 4,464,471, Cl. 435-253.000.
University of Kentucky Research Foundation: *See*—
Hussain, Anwar A., 4,464,378, Cl. 424-260.000.
University of Missouri, The Curators of the: *See*—
Hitchcock, William S.; and Stampfer, Joseph F., Jr., 4,464,343, Cl. 423-3.000.
University of Rhode Island: *See*—
Langdon, Christopher, 4,464,230, Cl. 204-1.00T.
UNR Industries, Inc.: *See*—
Knuth, Henry A.; and Daily, Virgil W., III, 4,463,746, Cl. 126-25.00R.
UOP Inc.: *See*—
Duneau, Michel, 4,464,260, Cl. 210-232.000.
Hilfman, Lee; and O'Hara, Mark J., 4,464,481, Cl. 502-228.000.
Kaplan, Milton L., 4,464,350, Cl. 423-244.000.
Varady, Victor A., 4,464,476, Cl. 502-6.000.
Windawi, Hassan; and Lawson, Randy J., 4,464,480, Cl. 502-207.000.
Upjohn Company, The: *See*—
Argoudelis, Alexander D.; and Stroman, David W., 4,464,466, Cl. 435-92.000.
Upmeier, Hartmut; Klinge, Gerd; and Winkler, Gerhard, to Windmoller & Holscher. Method of controlling the film thickness at a blown film installation. 4,464,318, Cl. 264-40.100.
Ura, Shigeru: *See*—
Kawakami, Shigenao; Saka, Terumasa; Ura, Shigeru; Iwata, Mikio; Tokugawa, Yoshiharu; and Jinno, Naoyoshi, 4,464,505, Cl. 524-512.000.
Urner Wille, Marlies; and Hansen, Peter, to U.S. Philips Corporation. Magneto-optical memory element. 4,464,437, Cl. 428-458.000.
Urushihara, Kazunobu: *See*—
Kiuchi, Masayoshi; Uchidoi, Masanori; and Urushihara, Kazunobu, 4,464,032, Cl. 354-234.100.
Usher, Peter P.; and Gavaletz, Eugene J., to Metex Corporation. Composite gasket including rings of refractory sheet material and knitted wire mesh. 4,463,959, Cl. 277-230.000.
Ushio Denki Kabushikikaisha: *See*—
Hiramoto, Tatsumi, 4,464,336, Cl. 422-24.000.
Ushioda, Minoru; Ueno, Kenji; and Kobayashi, Masahiro, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Porous particulate polyvinyl chloride impregnated with alkyl vinyl and alkyl methacrylate polymers. 4,464,503, Cl. 524-425.000.
Utsunomiya, Nobu: *See*—
Imagawa, Noriyuki; and Utsunomiya, Nobu, 4,463,863, Cl. 215-343.000.
Uttscheid, Georg. Rack and pinion drive trolley with slip-ring drive wheel. 4,463,683, Cl. 105-29.00R.
Uyeo, Shoichiro, to Shionogi & Co., Ltd. Antibacterial carbapenem compounds. 4,464,299, Cl. 260-245.20T.
Vaeth, Guenter: *See*—
Autzen, Horst; Motz, Herbert; Rudolf, Peter; Sarnecki, Wilhelm; Steck, Werner; and Vaeth, Guenter, 4,464,352, Cl. 423-634.000.
Vaill, Ronald E.: *See*—
Davies, Norman; and Vaill, Ronald E., 4,464,703, Cl. 361-342.000.
Valentin, Guenter: *See*—
Strehler, Hugo; Kegel, Robert; Valentin, Guenter; and Hoerauf, Werner, 4,464,266, Cl. 210-703.000.
Valeo: *See*—
Villeval, Denis, 4,463,802, Cl. 165-104.320.
Valle Arizpe, Fernando. Coffin, vault and mausoleum module combination. 4,463,484, Cl. 27-2.000.
Valmet OY: *See*—
Karvinen, Mikko, 4,464,226, Cl. 162-358.000.
Vamvakas, Michael. Piston-type valve with slip clutch actuated limit switch. 4,463,930, Cl. 251-134.000.
Vance, Jeffrey D., to PPG Industries, Inc. Near infrared absorbing polymerizate, from dicarboxylic compound, diol bis(allyl carbonate) and metal hexacarbonyl. 4,464,525, Cl. 528-9.000.
Vancheri, Patrice; and Lefebvre, Henri, to Societe Syselec (S.A.R.L.). Safety marker for divers. 4,464,129, Cl. 441-16.000.
van den Broeke, Aleidus G.: *See*—
van den Broeke, Johan R.; and van den Broeke, Aleidus G., 4,463,461, Cl. 4-288.000.
van den Broeke, Johan R.; and van den Broeke, Aleidus G., to Viplex-Plastics B.V. Discharge pit having a water trap. 4,463,461, Cl. 4-288.000.
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Hudson, Wilbur G.; Webb, Tommy W.; Phillips, William S.; Tompa, Thomas J.; and Sanders, Edward, Jr., to Lummus Industries, Inc. System for baling textile waste from a plurality of sources. 4,463,669, Cl. 100-43.000.
Vandrish, George, to Pylon Electronic Development Co., Ltd. Sampling devices for detecting particulate contaminants. 4,464,574, Cl. 250-432.0PD.
Van Gerwen, Petrus J.: *See*—
Snijders, Wilfred A. M.; Kalfs, Johannes J. W.; and Van Gerwen, Petrus J., 4,464,746, Cl. 370-32.000.
van Mullekom, Hubert P., to Ruti-te Strake B.V. Device for forming a storage coil from a thread supplied from a yarn supply. 4,463,910, Cl. 242-47.120.
Van Winkle, David W.: *See*—
Meister, Jack B.; and Van Winkle, David W., 4,463,706, Cl. 119-51.00R.
Varady, Victor A., to UOP Inc. Gas injection control. 4,464,476, Cl. 502-6.000.
Vasak, Vladimir; Sencar, Joze; and Mok, King K., to ICI Australia Limited. Process for the thermal destruction of solid metable halogenated waste with resultant production of hydrogen halide therefrom. 4,464,351, Cl. 423-486.000.
Vaseen, Vesper A.: *See*—
Stoddard, Xerxes T.; Vaseen, Vesper A.; and Terry, Ruel C., 4,463,807, Cl. 166-285.000.
Veislinger, Yves: *See*—
Baudoin, Michel; Carru, Jean-Pierre; and Veislinger, Yves, 4,464,542, Cl. 179-2.00C.
Velazquez, Juan F., to VSP Labs, Inc. Audio power amplifier. 4,464,634, Cl. 330-264.000.
Venture Innovations, Inc.: *See*—
House, Roy F., 4,464,274, Cl. 252-28.000.
Verboom, Johannes J.: *See*—
Huijser, Arie; Carasso, Marino G.; and Verboom, Johannes J., 4,464,714, Cl. 364-200.000.
Verdoorn, William G., Jr.: *See*—
Dixon, Jerry D.; Farrell, Robert H.; Merckel, Gerald U.; Neely, Jack D.; Schmitt, Stephen A.; Verdoorn, William G., Jr.; and Bandy, Peter B., 4,464,718, Cl. 364-200.000.
Vergato, Joseph A.: *See*—
Talmadge, Paul C.; and Vergato, Joseph A., 4,464,051, Cl. 356-323.000.
Verktygaindustrie I Blidsberg AB: *See*—
Mattsson, Per-Arne, 4,463,656, Cl. 91-20.000.
Victor Company of Japan, Ltd.: *See*—
Ono, Tsuyoshi; and Ohno, Fumiaki, 4,464,740, Cl. 369-41.000.
Vigny, Paul: *See*—
Bisagni, Emile; Dubertret, Louis; Moron, Jacqueline; Averbeck, Dietrich; Papadopoulo, Dora; Blais, Jocelyne; Vigny, Paul; Schwencke, Maria N.; Moustacchi, Ethel; Nocentini, Silvano; and Zajdela, Francois, 4,464,354, Cl. 424-59.000.
Vildgrube, Georgy S.; Kutuzov, Boris N.; Sokolsky, Valery N.; Missulovin, Leon Y.; and Kotov, Boris A. Method and device for correcting speech. 4,464,119, Cl. 434-185.000.
Villeval, Denis, to Valeo. Water box and expansion chamber device, e.g. for an internal combustion engine radiator. 4,463,802, Cl. 165-104.320.
Vinylex Corporation: *See*—
Simon, Melvin L., 4,463,539, Cl. 52-717.000.
Viplex-Plastics B.V.: *See*—
van den Broeke, Johan R.; and van den Broeke, Aleidus G., 4,463,461, Cl. 4-288.000.
Vision Laboratories Inc.: *See*—
Seidner, Steven, 4,463,458, Cl. 3-13.000.
Visky, Gyorgy: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Kreidl, Janos; Nemes, Andras; Farkas nee Kirjak, Maria; Visky, Gyorgy; and Czibula, Laszlo , 4,464,534, Cl. 546-51.000.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Kreidl, Janos; Visky, Gyorgy; Nemes, Andras; Czibula, Laszlo ; and Farkas nee Kirjak, Maria, 4,464,535, Cl. 546-51.000.

Vitols, Reinhards; Walkinshaw, Steven; and Wray, Gordon R., to National Research Development Corporation. Knitting process and machine. 4,463,581, Cl. 66-87.000.
Vock, Manfred H.: *See*—
Pittet, Alan O.; Vock, Manfred H.; Courtney, Thomas F., Jr.; and Muralidhara, Ranya, 4,464,408, Cl. 426-535.000.
Voegtlin, Rene, to Mecatherm. Device for the final elongation of pieces of dough to a long length. 4,464,105, Cl. 425-364.00R.
Vogt, James A.: *See*—
Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., 4,464,261, Cl. 210-282.000.
Vogt, Siegfried; Hagemeyer, Gunter; and Klopperpieper, Friedrich, to Kocha Adler AG. Method and device for producing a pocket on a workpiece. 4,463,697, Cl. 112-262.300.
Vogt, Werner, to Interlock Sicherheitsysteme. Method for producing an information carrier in the form of a card and an information carrier produced in accordance with the method. 4,464,454, Cl. 430-256.000.
Voigt, Hermann U.; and Schleese, Eckard, to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Foamed polymeric shrink-fit objects and their process of manufacture. 4,464,425, Cl. 428-35.000.
Voith Getriebe KG: *See*—
Polzer, Erich; Ruetz, Gottfried; Schmolz, Herbert; and Pochon, Remy, 4,463,556, Cl. 60-330.000.
Voith Transmit GmbH: *See*—
Lindenthal, Hans, 4,464,139, Cl. 464-69.000.
Voloshin, Gennady A.: *See*—
Surovikin, Vitaly F.; Antonenko, Vladimir F.; Babich, Gennady V.; Bobrik, Mikhail Y.; Korenyak, Nikolai K.; Novikov, Vasily V.; Voloshin, Gennady A.; Belyaev, Georgy A.; Gordeev, Alexandr V.; Gallyamov, Nail I.; and Krikunenko, Anatoly F., 4,464,314, Cl. 261-79.00A.
Von Roll AG.: *See*—
Andreoli, Bruno, 4,463,688, Cl. 110-298.000.
VonFeldt, William: *See*—
Pickett, David M.; Knutson, Richard K.; and VonFeldt, William, 4,463,701, Cl. 114-245.000.
Von Osten, Reimer, to U.S. Philips Corporation. Data input or output apparatus incorporating functional testing. 4,464,722, Cl. 364-551.000.
Voorhis, Ray: *See*—
Cholin, John M.; Cholin, Jeffrey G.; and Voorhis, Ray, 4,464,575, Cl. 250-554.000.
Vorobyov, Michael, to Unger Enterprises, Inc. Locking mechanism for telescoped poles. 4,464,078, Cl. 403-351.000.
Vorwerk & Co Interholding GmbH: *See*—
Uibel, Paul-Ulrich, 4,463,472, Cl. 15-327.00F.
Voss, James R.: *See*—
Bullis, Robert H.; DiDomenico, Robert A.; Kimberley, John A.; McHugh, Thomas M.; Parent, Christopher A.; Voss, James R.; and Wiegand, Walter J., 4,463,729, Cl. 123-478.000.
Voyer, Peter E.: *See*—
Trousdell, Edmund D.; and Voyer, Peter E., 4,464,096, Cl. 416-215.000.
Vsesojuzny Nauchnoissledovatelsky I Proektny Institut Mekhanicheskoi Obrabotki Poleznykh Iskopaemykh: *See*—
Ivanov, Nikolai A.; Ivanov, Boris G.; Zagoratsky, Leonid P.; Mitrofanov, Evgeny S.; Cherkassky, Vladimir A.; Finkelshtein, Georgy A.; Blekhman, Ilya I.; Barzukov, Oleg P.; Kaljunov, Gennady A.; Khinich, Isaak Y.; and Turkin, Vladimir Y., 4,463,908, Cl. 241-207.000.
VSP Labs, Inc.: *See*—
Velazquez, Juan F., 4,464,634, Cl. 330-264.000.
Vyas, Frank N.: *See*—
Ceresa, Myron; Vyas, Frank N.; and Zimmerman, Richard H., 4,464,541, Cl. 174-84.00C.
W. H. Company, Inc.: *See*—
Holm, William J., 4,463,483, Cl. 26-29.00P.
W. P. Dawson, Inc.: *See*—
Burmeister, Lewis H., 4,464,548, Cl. 200-33.00R.
W. R. Grace & Co.: *See*—
Cogliano, Joseph A., 4,464,215, Cl. 156-71.000.
Wachtel, James A.: *See*—
Farrell, Christopher J.; Tsai, Boh C.; and Wachtel, James A., 4,464,443, Cl. 428-688.000.
Wada, Minoru: *See*—
Saito, Yoshikuni; Hashimoto, Hitoshi; Arai, Isao; and Wada, Minoru, 4,463,490, Cl. 29-566.100.
Wada, Yasuto, to Ichikoh Industries Limited. Remotely controlled mirror apparatus for motor vehicles. 4,464,017, Cl. 350-307.000.
Wagner, James B.; and Chamberlain, Harvey H., to General Electric Company. Turbine speed control. 4,464,577, Cl. 290-40.00A.
Wakano, Shigeru; Sakoda, Akito; Fukui, Kunihiro; and Nishihara, Minoru, to Sumitomo Metal Industries, Lt. Production of one-side electroplated steel sheet. 4,464,232, Cl. 204-28.000.
Wakase, Hiroshi, to Takara Co., Ltd. Spring powered prime mover. 4,463,831, Cl. 185-39.000.
Wakita, Hiizu: *See*—
Uchida, Tadahiro; Wakita, Hiizu; and Hara, Minoru, 4,464,161, Cl. 494-7.000.
Walker, Thad O.; and Matthews, Patricia C., to Exxon Research & Engineering Co. Additive composition for release of stuck drill pipe. 4,464,269, Cl. 252-8.55R.
Walkinshaw, Steven: *See*—
Vitols, Reinhards; Walkinshaw, Steven; and Wray, Gordon R., 4,463,581, Cl. 66-87.000.
Wallace, Cornelius J. Shaping balloons and inflatable spheres. 4,463,513, Cl. 446-222.000.
Wallace, Lynn A.; and Sallach, Max E. Fitness evaluation apparatus. 4,463,946, Cl. 272-111.000.
Wallin, Ralf: *See*—
Rydquist, Jan E.; Sandberg, Lars; and Wallin, Ralf, 4,463,565, Cl. 60-602.000.
Wallis, Roger. Torch, useful in air-carbon arc processes. 4,464,555, Cl. 219-69.00R.
Walton, Jean. Self-adjusting chucks. 4,463,960, Cl. 279-60.000.
Wankel GmbH: *See*—
Eiermann, Dankwart, 4,464,102, Cl. 418-179.000.
Wargo, Robert A., to RCA Corporation. Method and apparatus for operating a microprocessor in synchronism with a video signal. 4,464,679, Cl. 358-148.000.
Warner Lambert Technologies, Inc.: *See*—
Pilley, H. Robert, 4,464,608, Cl. 315-241.00P.
Washburn, Jack S. Defibrillator gel dispenser. 4,464,412, Cl. 427-2.000.
Washington University, The: *See*—
Thies, Curt; and Linek, Francis W., 4,464,317, Cl. 264-4.300.
Watanabe, Fumio; and Mizuguchi, Yoshihiko, to Kokusai Denshin Denwa Kabushiki Kaisha. Multiple reflector antenna. 4,464,666, Cl. 343-781.00P.
Watanabe, Kouji: *See*—
Suzuki, Hiroyuki; Andoh, Ikuhiro; and Watanabe, Kouji, 4,464,002, Cl. 339-97.00P.
Watanabe, Naoe: *See*—
Yokomizo, Yuji; Yuuki, Keiji; and Watanabe, Naoe, 4,464,647, Cl. 338-35.000.
Watanabe, Rikizo, to Hitachi Metals, Ltd. Ni-Cr-W alloy having improved high temperature fatigue strength and method of producing the same. 4,464,210, Cl. 148-162.000.
Watanabe, Takashi: *See*—
Hattori, Yoshihiro; Watanabe, Takashi; and Maeda, Kunio, 4,464,435, Cl. 428-409.000.
Watanabe, Yoshihiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Slip issuing device. 4,463,939, Cl. 270-1.100.
Wathey, John G. Ice guard for protecting pilings. 4,464,083, Cl. 405-216.000.
Watkins, Dale F.: *See*—
Pogson, John T.; Shannon, Roger L.; Hamasaki, Robert H.; Franklin, James L.; Watkins, Dale F.; and Kramer, Ted J., 4,463,798, Cl. 165-1.000.
Watkins, Hugh: *See*—
Boden, Richard M.; Tyszkiewicz, Theodore J.; and Watkins, Hugh, 4,464,280, Cl. 252-174.110.
Watts, Chester B., Jr. Slotted cable antenna structure. 4,464,665, Cl. 343-769.000.
Webb, Bryant F.: *See*—
Jackson, Robert E.; Crawford, Leroy A.; and Webb, Bryant F., 4,463,668, Cl. 100-24.000.
Webb, Tommy W.: *See*—
Van Doorn, Donald W.; Hawkins, James B.; Carpenter, Francis W., III; Hudson, Wilbur G.; Webb, Tommy W.; Phillips, William S.; Tompa, Thomas J.; and Sanders, Edward, Jr., 4,463,669, Cl. 100-43.000.
Weber, Charles A.: *See*—
Weber, Randall W.; and Weber, Charles A., 4,464,016, Cl. 350-289.000.
Weber, Georg: *See*—
Hasegawa, Shinji; Toriyama, Kazuhisa; Pohl, Ludwig; and Weber, Georg, 4,464,283, Cl. 252-299.630.
Weber, Randall W.; and Weber, Charles A., to Bock Products, Inc. Power-adjusted mirror with motor on housing and offset center wheel. 4,464,016, Cl. 350-289.000.
Weber, Roger E.: *See*—
McDowell, Leon H.; Weber, Roger E.; and Schmieder, Daniel J., 4,463,605, Cl. 73-432.0SD.
Wehrli, Hansuli; Kocsis, Karoly; and Scartazzini, Riccardo, to Ciba Geigy Corporation. Cephem compounds having a terminal aminoacarboxylic acid grouping and containing an azacyclyl(thio)ureido group. 4,464,366, Cl. 424-246.000.
Weichert, Rudolf: *See*—
Bittler, Dieter; Laurent, Henry; Weichert, Rudolf; Casals-Stenzel, Jorge; and Schillinger, Ekkehard, 4,464,364, Cl. 424-241.000.
Weick, Larry J.: *See*—
Horstmeyer, Robert J.; and Weick, Larry J., 4,463,814, Cl. 175-45.000.
Weigmann, Gerhard: *See*—
Stojek, Dieter; and Weigmann, Gerhard, 4,463,712, Cl. 123-90.170.
Weimer, Raymond J.; and Kim, Chulho, to United States of America, Navy. Hybrid shaped-charge/kinetic/energy penetrator. 4,463,678, Cl. 102-307.000.
Weinhold, Karl. Pipe coupling means for connecting two pipe ends to each other. 4,463,972, Cl. 285-175.000.
Weisenburger, Lawrence P.: *See*—
Reavis, Robert P.; Mayberry, Mickey L.; Willette, David; Weisenburger, Lawrence P.; and Bates, Reginald A., 4,463,998, Cl. 339-40.000.
Weiser, Kurt: *See*—
Wolf, Stuart A.; Strom, Ulrich; and Weiser, Kurt, 4,464,065, Cl. 374-121.000.
Weiss, Richard: *See*—
Dost, Gerhard; Gerber, Walter; Jaeger, Eberhard; Moschter, Erwin; and Weiss, Richard, 4,464,432, Cl. 428-280.000.
Welker Engineering Company: *See*—
Welker, Robert H., 4,463,599, Cl. 73-61.10R.
Welker, Robert H., 4,463,603, Cl. 73-168.000.

Welker, Robert H., to Welker Engineering Company. Free water volume analyzer. 4,463,599, Cl. 73-61.10R.
Welker, Robert H., to Welker Engineering Company. Volume analyzer for crude oil sampling system including bite checking apparatus. 4,463,603, Cl. 73-168.000.
Weller, Barton L. World time and day indicator clock. 4,464,058, Cl. 368-21.000.
Wendt, Alan C., to United States Gypsum Company. Glass stop assembly. 4,463,535, Cl. 52-397.000.
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Werner, Jean J., to Bell Telephone Laboratories, Incorporated. Echo canceller. 4,464,545, Cl. 179-170.200.
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Culver, Frank R., 4,464,546, Cl. 191-49.000.
Davies, Norman; and Vaill, Ronald E., 4,464,703, Cl. 361-342.000.
Ludwig, Richard H.; Dirnberger, Linus R.; and Husson, Alan L., 4,463,833, Cl. 187-29.00R.
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Schroeder, Eugene R., 4,464,049, Cl. 356-218.000.
Sun, Shan C., 4,464,697, Cl. 361-64.000.
Westphal, Mark A., to Lee-Norse Company. Sealed hinge. 4,463,973, Cl. 285-298.000.
Westvaco Corporation: *See—*
Schilling, Peter, 4,464,285, Cl. 252-311.500.
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Whelan, Patrick: *See—*
Sprecker, Mark A.; and Whelan, Patrick, 4,464,291, Cl. 252-522.00R.
Whiteside, Robert C.; and Greynolds, Fred L., to Leesona Corporation. Differential pressure synthetic plastic forming machine and method with formed article carrier means. 4,464,329, Cl. 264-544.000.
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Saidla, Glen W., 4,464,320, Cl. 264-45.300.
Wich, Thomas J., to General Motors Corporation. Electromagnetic unit fuel injector. 4,463,900, Cl. 239-88.000.
Wiechert, Rudolf: *See—*
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Wiedenmann, Hans-Martin: *See—*
Raff, Lothar; and Wiedenmann, Hans-Martin, 4,463,594, Cl. 73-23.000.
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Wilcoxson, Henry V. Electro-dynamic power converter. 4,463,555, Cl. 60-325.000.
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Smathers, Robert E.; Wildman, John R.; and Meyer, Burton C., 4,463,518, Cl. 446-237.000.
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Bentjens, Bernd, 4,464,086, Cl. 407-25.000.
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Becker, Willi, 4,463,700, Cl. 114-162.000.
Williams, Cyril J. Fuel enconomizer. 4,463,742, Cl. 123-590.000.
Williams, James O., to Facet Enterprises, Inc. Engine starter drive. 4,464,576, Cl. 290-38.00R.
Williamson, Andrew O. Earth moving apparatus. 4,463,812, Cl. 172-136.000.
Willis, Brian D., to Brian D. Willis, P.C. Toothbrush. 4,463,470, Cl. 15-167.00R.
Willis, Edwin: *See—*
Parslow, Michael W.; and Willis, Edwin, 4,464,272, Cl. 252-8.800.
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Hiraoka, Hiroyuki; Hofer, Donald C.; Miller, Robert D.; Pederson, Lester A.; and Willson, Carlton G., 4,464,460, Cl. 430-323.000.
Wilson, Robert J.: *See—*
Hillstrom, Thomas P.; Wilson, Robert J.; and Corwith, John T., 4,464,604, Cl. 315-79.000.
Wilt, Donald A., to Paccar Inc. Wiring system for trucks with improved firewall connection system. 4,464,006, Cl. 339-126.00R.
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Windawi, Hassan; and Lawson, Randy J., to UOP Inc. Method for obtaining improved catalyst systems. 4,464,480, Cl. 502-207.000.
Winders, Richard: *See—*
Hillier, Edward; Graybill, Larry; Winders, Richard; Bridge, Dan; and Dauchy, Joe, 4,464,081, Cl. 405-128.000.
Windish, Richard J. Space saving variable length tag display device. 4,463,510, Cl. 40-124.400.
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Ottenhues, Ludger, 4,463,675, Cl. 101-157.000.
Upmeier, Hartmut; Klinge, Gerd; and Winkler, Gerhard, 4,464,318, Cl. 264-40.100.
Wingen, Rainer: *See—*
Bosse, Dieter; Wingen, Rainer; Horn, Klaus; and Lutz, Walter, 4,464,457, Cl. 430-288.000.
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Diamond, Jeffrey; and Winkler, David S., 4,464,500, Cl. 524-258.000.
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Winner, Joe K., to Bendix Corporation, The. Combustible gas detection system. 4,464,653, Cl. 340-501.000.
Winsche, Martha J.: *See—*
Klungle, Mark C.; Haase, Charles A.; and Winsche, Martha J., 4,463,684, Cl. 108-91.000.
Winter, David C., to Deere & Company. Implement with laterally movable frame structure. 4,463,811, Cl. 172-26.000.
Winter, William E., Jr.: *See—*
Eberly, Paul E., Jr.; and Winter, William E., Jr., 4,464,252, Cl. 208-243.000.
Winterer, Hermann: *See—*
Sick, Erwin; Fetzer, Gunter; and Winterer, Hermann, 4,464,014, Cl. 350-105.000.
Wirsen, Lars E.: *See—*
Stenerhag, Bo; and Wirsen, Lars E., 4,464,700, Cl. 361-307.000.
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Munteanu, Marina A.; Cseko, Christine; Oltarzewski, Edward S.; Lindauer, Jerome I.; and Withycombe, Donald A., 4,464,271, Cl. 252-8.600.
Wittren, Richard A., to Deere & Company. Compensating valve. 4,463,775, Cl. 137-111.000.
Wohlsen, William D., to Combustion Engineering, Inc. Molten core retention and solidification apparatus. 4,464,333, Cl. 376-280.000.
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Wolf, Stuart A.; Strom, Ulrich; and Weiser, Kurt, to United States of America, Navy. Fast granular superconducting bolometer. 4,464,065, Cl. 374-121.000.
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Russell, Gilbert E.; and Wong, Hee, 4,464,676, Cl. 358-37.000.
Wong, Patrick S.; Langston, Jimmy B.; and Leeper, Harold M., to ALZA Corporation. Container housing biocidal dispensing device. 4,464,258, Cl. 210-205.000.
Wood, Godfrey A.: *See—*
Arthur, High M.; Dyett, Derek H.; and Wood, Godfrey A., 4,463,766, Cl. 131-84.00R.
Woolhouse, Robin A., to Imperial Chemical Industries Limited. Electrode for use in electrolytic cell. 4,464,243, Cl. 204-257.000.
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Shorter, John J.; Woolnough, Victor J.; and Brewer, Michael W., 4,463,459, Cl. 3-30.000.
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Goodman, Joseph R.; Woratyla, John A.; and Zell, Dale R., 4,464,003, Cl. 339-99.00R.
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Bouck, Larry S.; Ozey, Erhan; and Worsham, Richard E., 4,463,988, Cl. 299-2.000.
Wozniak, Jan C., to Serni Limited. Shoring supports. 4,464,084, Cl. 405-288.000.
Wray, Gordon R.: *See—*
Vitols, Reinhards; Walkinshaw, Steven; and Wray, Gordon R., 4,463,581, Cl. 66-87.000.
Wright, Fred C.: *See—*
Kochansky, Jan; and Wright, Fred C., 4,464,390, Cl. 424-300.000.
Wright, Randall J.; and Macklin, Gary T., to Empire Level Mfg. Corp. Level construction and methods of constructing a level. 4,463,501, Cl. 33-350.000.

Wu, Joseph M.: *See*—
Suhadolnik, Robert J.; Wu, Joseph M.; Doetsch, Paul; and Henderson, Earl E., 4,464,359, Cl. 424-180.000.

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Kroeger, Ingo; and Wuerzer, Bruno, 4,464,195, Cl. 71-91.000.

Wyatt, James R. Carrier for large planar articles. 4,463,977, Cl. 294-26.000.

Wyatt, William G., to Trans Texas Energy, Inc. Downhole vapor generator and method of operation. 4,463,803, Cl. 166-59.000.

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Gruber, Robert J.; Julien, Paul C.; and Yourd, Raymond A., III, 4,464,452, Cl. 430-110.000.
Teuscher, Leon A., 4,464,450, Cl. 430-59.000.

Yagi, Kunihiro: *See*—
Munakata, Chusuke; Yagi, Kunihiro; and Motooka, Teruaki, 4,464,627, Cl. 324-158.00R.

Yamada, Katuyuki: *See*—
Toyoda, Kazuhiro; Sugo, Yasuhisa; and Yamada, Katuyuki, 4,464,735, Cl. 365-190.000.

Yamada, Yasuaki; Ozawa, Toshiaki; and Kondo, Hiroatsu, to Canon Kabushiki Kaisha. Printing apparatus display device for simultaneously displaying complete words. 4,464,069, Cl. 400-83.000.

Yamada, Yu, to Canon Kabushiki Kaisha. Optical system for microfilm. 4,464,024, Cl. 350-465.000.

Yamagata, Seiichi: *See*—
Kajita, Koji; Nakayama, Takashi; and Yamagata, Seiichi, 4,463,549, Cl. 57-328.000.

Yamagata, Shinji; Hisatsune, Fumiyuki; Terachi, Junichi; and Yoshiyasu, Hajimu, to Mitsubishi Denki Kabushiki Kaisha. Circuit breaker. 4,464,642, Cl. 335-201.000.

Yamagishi, Yoshio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for collecting X-ray absorption data in X-ray computed tomography. 4,464,775, Cl. 378-5.000.

Yamaguchi, Keiki: *See*—
Takeuchi, Yasuhito; and Yamaguchi, Keiki, 4,463,608, Cl. 73-606.000.

Yamaguchi, Tadashi: *See*—
Tanaka, Hiroyuki; and Yamaguchi, Tadashi, 4,464,148, Cl. 474-167.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Kobayashi, Takashi, 4,464,144, Cl. 474-14.000.

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Nishito, Akihiro; Ohtombe, Ko; Yamakawa, Susumu; and Nakamura, Yasushi, 4,464,786, Cl. 382-7.000.

Yamamiya, Kunio: *See*—
Kato, Kiichi; Sakamoto, Masaharu; Yoshikawa, Shoji; Yamamiya, Kunio; Kodama, Hiroshi; and Ohsima, Ken, 4,464,050, Cl. 356-237.000.

Yamamoto, Itaru. Immunomodulator containing trithiazole pentamethine cyanine derivative. 4,464,383, Cl. 424-270.000.

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Takayanagi, Shinji; Kato, Yoshitaka; Nanno, Kunio; Yasunaga, Osamu; Takeuchi, Osamu; Yamamoto, Ryozo; Iwai, Kazuhiro; and Kasai, Hiroshi, 4,463,964, Cl. 280-284.000.

Yamanaka, Junichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Television camera having automatic focusing device for electron beam of pickup tube. 4,464,680, Cl. 358-218.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Murase, Kiyoshi; Mase, Toshiyasu; Arima, Hideki; Niigata, Kunihiro; Tomioka, Kenichi; and Kobayashi, Shinichiro, 4,464,384, Cl. 424-270.000.

Yamatake-Honeywell Co., Ltd.: *See*—
Kojima, Tadashi; Uchihama, Tetsuo; Tanaka, Kazuyoshi; Morozumi, Eiichi; Inoue, Kentaro; and Shito, Naomichi, 4,463,773, Cl. 137-38.000.

Yamazaki, Shunpei. Photoelectric conversion semiconductor manufacturing method. 4,464,415, Cl. 427-39.000.

Yamazaki, Yoshio: *See*—
Omori, Kazuo; Tsuchiya, Hiroshi; Yamazaki, Yoshio; and Inowa, Shigeru, 4,464,042, Cl. 355-3.0SH.

Yan, Tsoung-Yuan, to Mobil Oil Corporation. Method of precipitating contaminants in a uranium leachate using ferri ions, complexing agent, and pH control. 4,464,345, Cl. 423-7.000.

Yanmar Diesel Engine Company Ltd.: *See*—
Aso, Kinichi; and Shinada, Kazuyoshi, 4,464,128, Cl. 440-112.000.

Yantovsky, Leonid I.; Miroshnichenko, Anatoly G.; and Berzin, Evgeny K., to Kharkovsky Politekhnichesky Institut. Superconducting synchronous electric machine. 4,464,617, Cl. 318-717.000.

Yao, Neng-Ping: *See*—
Minh, Nguyen Q.; Loutfy, Raouf O.; and Yao, Neng-Ping, 4,464,234, Cl. 204-67.000.

Yasui, Hiroyoshi, to Koyo Seiko Co., Ltd. Rust preventive oil for a low frictional torque tapered roller bearing. 4,464,275, Cl. 252-32.70E.

Yasunaga, Osamu: *See*—
Takayanagi, Shinji; Kato, Yoshitaka; Nanno, Kunio; Yasunaga, Osamu; Takeuchi, Osamu; Yamamoto, Ryozo; Iwai, Kazuhiro; and Kasai, Hiroshi, 4,463,964, Cl. 280-284.000.

Yatsugake, Yasuo: *See*—
Takahashi, Kensaku; Yatsugake, Yasuo; Iwaya, Fukuo; Ito, Makoto; Takami, Katsumi; and Suda, Kyo, 4,464,011, Cl. 350-6.100.

Yavitz, Edward Q.: *See*—
Kramer, Steven G.; and Yavitz, Edward Q., 4,463,880, Cl. 222-189.000.

Yeh, Hsu-Chi; and Cheng, Yung-Sung, to United States of America, Energy. Parallel flow diffusion battery. 4,463,595, Cl. 73-28.000.

Yellin, Tobias O.; Gilman, David J.; Jones, Derrick F.; and Oldham, Keith, to ICI Americas Inc.; and Imperial Chemical Industries PLC. Substituted guanidine derivatives, processes, pharmaceutical compositions and methods and intermediates. 4,464,374, Cl. 424-251.000.

Yellowlees, John M., to National Nuclear Corporation Limited. Pressure vessels. 4,463,872, Cl. 220-428.000.

Yokogawa Hokushin Electric Corp.: *See*—
Takeuchi, Yasuhito; and Yamaguchi, Keiki, 4,463,608, Cl. 73-606.000.

Yokomizo, Yuji; Yuuki, Keiji; and Watanabe, Naoe, to Marcon Electronics Co. Ltd.; and Japan Electronic Industry Development Association. Humidity sensor made of metal oxide. 4,464,647, Cl. 338-35.000.

Yokota, Mitsuyoshi: *See*—
Matsumoto, Akio; Morishita, Mitsuharu; Yokota, Mitsuyoshi; and Kouge, Shinichi, 4,464,594, Cl. 310-63.000.

Yokota, Muneto: *See*—
Iwabuchi, Takeshi; Morinaga, Hiroshi; Kawahara, Masao; Kamiyama, Sakae; Sato, Terumi; and Yokota, Muneto, 4,464,518, Cl. 526-127.000.

Yomogida, Katsuyuki: *See*—
Ohta, Saburo; Nakamura, Shoji; Hayashi, Katsutake; Yomogida, Katsuyuki; Morohoshi, Hideo; Hirose, Seiichi; Uehara, Keiichi; Aizawa, Masanori; Sato, Yoshihisa; Ichikawa, Hideyuki; Tejima, Masayuki; and Togano, Seisaku, 4,464,290, Cl. 252-522.00R.

Yoneda, Yasuhiro; Kitamura, Kenroh; Naito, Jiro; and Kitakohji, Toshisuke, to Fujitsu Limited. Dry-developing negative resist composition. 4,464,455, Cl. 430-270.000.

Yonekawa, Tadao, to Shinmei Engineering Company Limited. Molten metal stirring equipment. 4,463,935, Cl. 266-233.000.

York, Billie M., Jr., to Alcon Laboratories, Inc. Treatment of diabetic complications with hydantoins. 4,464,385, Cl. 424-273.00R.

Yoshida Kogyo K. K.: *See*—
Matsuda, Yoshio, 4,463,486, Cl. 28-161.000.

Yoshida, Kunio; and Ikemoto, Yutaka, to Sharp Kabushiki Kaisha. Speech synthesizer timepiece with advance announcement. 4,464,059, Cl. 368-63.000.

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Takei, Yukio; Yoshida, Masao; and Nishizawa, Rinzo, 4,464,532, Cl. 544-237.000.

Yoshida, Noboru: *See*—
Atsumi, Toshio; Tarumi, Yuzo; Sanjiki, Tetsutaro; Takebayashi, Yoshiaki; and Yoshida, Noboru, 4,464,531, Cl. 536-17.400.

Yoshida, Shigeru; and Kawai, Yasuo, to Canon Kabushiki Kaisha. Magnetic sheet cassette device. 4,464,692, Cl. 360-133.000.

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Nakada, Seiichi; Yoshikawa, Hiromi; Ohno, Hiroshi; Nishijima, Tsuneo; and Kawakami, Hiroshi, 4,463,473, Cl. 15-339.000.

Yoshikawa, Shoji: *See*—
Kato, Kiichi; Sakamoto, Masaharu; Yoshikawa, Shoji; Yamamiya, Kunio; Kodama, Hiroshi; and Ohsima, Ken, 4,464,050, Cl. 356-237.000.

Yoshimi, Akiro; Kuwajima, Takeshi; Ootsuka, Fumio; and Matsushima, Takeo, to B Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Air induction control system for vehicle air conditioners. 4,463,801, Cl. 165-43.000.

Yoshimura, Shohei; and Kuwabara, Hideki, to Japan Styrene Paper Corporation. Process for producing prefoamed polymer particles. 4,464,484, Cl. 521-58.000.

Yoshino Kogyosho Co., Ltd.: *See*—
Yoshino, Yataro; Tsukada, Takami; Saito, Tadao; and Nozawa, Takamitsu, 4,463,860, Cl. 215-12.00R.
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Yoshino, Yataro; Tsukada, Takami; Saito, Tadao; and Nozawa, Takamitsu, to Yoshino Kogyosho Co., Ltd. Saturated polyester resin bottle and stand. 4,463,860, Cl. 215-12.00R.

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Yoshioka, Yuichi, to Honda Giken Kogyo Kabushiki Kaisha. Carburetion system for a V-type internal combustion engine. 4,463,711, Cl. 123-52.0MV.

Yoshiyasu, Hajimu: *See*—
Yamagata, Shinji; Hisatsune, Fumiyuki; Terachi, Junichi; and Yoshiyasu, Hajimu, 4,464,642, Cl. 335-201.000.

Yoshizaki, Atsuhiro, to Hitachi, Ltd. Protective relay. 4,464,698, Cl. 361-79.000.

Young, Charles J., to Data General Corporation. Digital data processing system using unique formatting techniques for performing arithmetic ALU operations. 4,464,716, Cl. 364-200.000.

Young, Hartley F.; and Remes, Wally A. Rail fasteners. 4,463,898, Cl. 238-310.000.

Young, Thomas M., to United States of America, Energy. Electronically controlled cable wrapper. 4,463,547, Cl. 57-6.000.

Yourd, Raymond A., III: *See*—
Gruber, Robert J.; Julien, Paul C.; and Yourd, Raymond A., III, 4,464,452, Cl. 430-110.000.

Yukon Energy Corporation: *See*—
Lenertz, John L., 4,463,787, Cl. 144-193.00R.

Yuuki, Keiji: *See*—
Yokomizo, Yuji; Yuuki, Keiji; and Watanabe, Naoe, 4,464,647, Cl. 338-35.000.

Zabler, Erich: *See*—
Burger, Kurt; Friedrich, Heinz; Gruner, Heiko; Linn, Karl-Otto; and Zabler, Erich, 4,464,646, Cl. 338-25.000.

Zagoratsky, Leonid P.: *See*—
Ivanov, Nikolai A.; Ivanov, Boris G.; Zagoratsky, Leonid P.; Mitrofanov, Evgeny S.; Cherkassky, Vladimir A.; Finkelshtein, Georgy A.; Blekhman, Ilya I.; Barzukov, Oleg P.; Kaljunov, Gennady A.; Khinich, Isaak Y.; and Turkin, Vladimir Y., 4,463,908, Cl. 241-207.000.

Zahir, Sheik A.: *See*—
Kramer, Hans; Zahir, Sheik A.; and Forster, Ewald, 4,464,486, Cl. 521-83.000.

Zahn, Wolfgang: *See*—
Findeis, Gunter; Fergg, Berthold; Zahn, Wolfgang; and Kuhn, Gerhard, 4,464,045, Cl. 355-38.000.

Zahnradfabrik Friedrichshafen, A.G.: *See*—
Holdenried, Willy, 4,463,559, Cl. 60-444.000.

Zaita, Katsuyuki, to Honda Giken Kogyo Kabushiki Kaisha. Carburetor for internal combustion engines. 4,464,312, Cl. 261-70.000.

Zajdela, Francois: *See*—
Bisagni, Emile; Dubertret, Louis; Moron, Jacqueline; Averbeck, Dietrich; Papadopoulo, Dora; Blais, Jocelyne; Vigny, Paul; Schwencke, Maria N.; Moustacchi, Ethel; Nocentini, Silvano; and Zajdela, Francois, 4,464,354, Cl. 424-59.000.

Zalar, Frank E.: *See*—
Kosmatka, Walter J.; and Zalar, Frank E., 4,464,600, Cl. 313-318.000.

Zarubai, Miklos: *See*—
Kocsis, Jozsef K.; Kiss, Laszlo ; Balajthy, Zoltan; Nagy, Peter; Pai nee Hazkoto, Gizella; Zarubai, Miklos; Sipos, Geza; Romhanyi, Andras; and Kokai, Rudolf, 4,464,504, Cl. 524-443.000.

Zell, Dale R.: *See*—
Goodman, Joseph R.; Woratyla, John A.; and Zell, Dale R., 4,464,003, Cl. 339-99.00R.

Zelle, C. Kenneth. Piston and cylinder assembly for blockade arm. 4,463,627, Cl. 74-569.000.

Zelman, Allen, to Rensselaer Polytechnic Institute. Dialysis processing of preserved living cells and cell components. 4,464,337, Cl. 422-41.000.

Zenith Electronics Corporation: *See*—
Dobrovolny, Pierre, 4,464,636, Cl. 330-300.000.
Rypkema, Jouke N., 4,464,635, Cl. 330-284.000.

Zeno, Robert V.; Lutz, George A.; and Amin, Jayendra J., to Ford Motor Company. Pressure responsive safety control for refrigerant compressor. 4,463,573, Cl. 62-157.000.

Ziegler, Carl B., Jr.: *See*—
Porter, Ned A.; Ziegler, Carl B., Jr.; and Roberts, David H., 4,464,304, Cl. 260-410.000.

Zimmerman, Richard H.: *See*—
Ceresa, Myron; Vyas, Frank N.; and Zimmerman, Richard H., 4,464,541, Cl. 174-84.00C.

Zimmerman, Robert L.; and Peterson, Bruce W., to Texaco Inc. Polyurethanes using monocarboxylic acid salts of bis(aminoethyl)ether derivatives as catalysts. 4,464,488, Cl. 521-115.000.

Zimmerman, Valentine; and Mrachek, Stephen J., to E. K. Industries, Inc. Powered downdraft gasifier. 4,463,687, Cl. 110-233.000.

Zimmerman, Wiley E.; Alexander, Jimmy R.; Boles, Don E.; and Bockhorst, Rhea W., to Conoco Inc. Current controller for heating stage on leitz microscope. 4,464,564, Cl. 219-497.000.

Ziolko, Francis J., to Devro, Inc. Apparatus for separating stuffed sausage links. 4,463,477, Cl. 17-34.000.

Ziv, Jacob: *See*—
Eastman, Willard L.; Lempel, Abraham; Ziv, Jacob; and Cohn, Martin, 4,464,650, Cl. 340-347.0DD.

Zoecon Corporation: *See*—
Baer, Ted A.; and Broadbent, Scott G., 4,464,307, Cl. 260-544.00N.

Zoleski, Benjamin H.: *See*—
Sung, Rodney L.; and Zoleski, Benjamin H., 4,464,276, Cl. 252-42.700.

Zorn, Guenter, to Robeet Bosch GmbH. Wiping device for window panes of a motor vehicle. 4,463,471, Cl. 15-250.190.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF AUGUST, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Asal, Jerrold R.; and Olthoff, James A., to Caterpillar Tractor Co. Angle and tilt implement assembly. Re. 31,642, Cl. 172-821.000.

Caterpillar Tractor Co.: *See*—
Asal, Jerrold R.; and Olthoff, James A., Re. 31,642, Cl. 172-821.000.

Derus, David L., to Nomadic Structures, Inc. Collapsible articulated wall structure. Re. 31,641, Cl. 52-109.000.

Freeman, Jerre M. [Neutral] Buoyancy intraocular lens device. Re. 31,640, Cl. 3-13.000.

Nomadic Structures, Inc.: *See*—
Derus, David L., Re. 31,641, Cl. 52-109.000.

Olthoff, James A.: *See*—
Asal, Jerrold R.; and Olthoff, James A., Re. 31,642, Cl. 172-821.000.

Waldman, Herbert H. Hold circuit for telephone system. Re. 31,643, Cl. 179-81.00R.

LIST OF DESIGN PATENTEES

AGHIFUG S.a.S. di Bonomi Giacomo Marino and C.: *See*—
Colombo, Aldo, 274,974, Cl. D8-38.000.

Airwick Industries, Inc.: *See*—
Hoyt, Earl, 274,981, Cl. D9-337.000.

Aktiebolaget Bofors: *See*—
Larsson, Torsten, 275,011, Cl. D15-28.000.

Aktiebolaget Halmstads Gummifabrik: *See*—
Johansson, Jan, 274,998, Cl. D12-203.000.

Alfa-Laval AB: *See*—
Andersson, Kjell S., 275,047, Cl. D34-40.000.

Andersson, Kjell S., to Alfa-Laval AB. Pallet. 275,047, 8-7-84, Cl. D34-40.000.

Aronowitz, Robert; and Katzanek, Bernard. Stool. 274,958, 8-7-84, Cl. D6-360.000.

AT&T Bell Laboratories: *See*—
Genaro, Donald M.; McGarvey, John N.; and Tilley, Alvin R., 275,004, Cl. D14-63.000.
Genaro, Donald M.; McGarvey, John N.; and Tilley, Alvin R., 275,005, Cl. D14-63.000.

AT&T Bell Telephone Laboratories: *See*—
Danielson, David C.; Genaro, Donald M.; and McGarvey, John N., 275,006, Cl. D14-63.000.

AT&T Technologies, Inc.: *See*—
Glembocki, Donald E.; and Novak, Lajos, 274,959, Cl. D6-555.000.

Ballinger, William H., to Milliken Research Corporation. Yarn guide. 275,013, 8-7-84, Cl. D15-78.000.

Bannigan, Francis R. Carrier for a drill and drill accessories. 275,048, 8-7-84, Cl. D34-44.000.

Becker, Julie. Table ornament. 274,993, 8-7-84, Cl. D11-131.000.

Beerens, Cornelis J. M. Hand saw guide. 274,975, 8-7-84, Cl. D8-71.000.

Benchmark Tool Company: *See*—
Haenel, Max K.; Irelan, Edward A.; and Legler, John G., 275,014, Cl. D15-124.000.

Betz Laboratories, Inc.: *See*—
Moyse, K. Robert, 275,031, Cl. D24-1.100.

Bohlman, Nadia N.; and Dau, Georgeann C. Cantilever shelf. 274,960, 8-7-84, Cl. D6-574.000.

Boldt, Melvin H.; Morrison, Thurber H.; and Stevens, James P., to National Presto Industries, Inc. Automatic temperature sensing electric heater. 275,029, 8-7-84, Cl. D23-122.000.

Bourque, Rene, to Warrington Inc. Skate boot. 274,954, 8-7-84, Cl. D2-275.000.

Bowen, Geoffrey. Evaporative cooler. 275,030, 8-7-84, Cl. D23-139.000.

Brown Jordan Company: *See*—
Thorpe, Robert K., 274,965, Cl. D6-484.000.

Brunaer, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., to Simmons Universal Corporation. Chest of drawers. 274,963, 8-7-84, Cl. D6-446.000.

Brzack, Jeffrey A. Frame for the leading edge of a glider. 275,021, 8-7-84, Cl. D21-91.000.

Cable Electric Products, Inc.: *See*—
Schwartz, Frederic W., 275,000, Cl. D13-30.000.
Schwartz, Frederic W., 275,001, Cl. D13-30.000.
Schwartz, Frederic W., 275,002, Cl. D13-30.000.
Schwartz, Frederic W., 275,003, Cl. D13-30.000.

Charves, Virginia; and Yee, Wayne J., to Milton Bradley International, Inc. Game board. 275,020, 8-7-84, Cl. D21-16.000.

Chase, Richard A.: *See*—
Simpson, Danny E.; Williams, D. Michael; Chase, Richard A.; and Grubb, Lawrence B., 275,022, Cl. D21-105.000.

Coca-Cola Company, The: *See*—
Morgan, Annis R., Jr.; and King, Eddie W., 275,019, Cl. D20-5.000.

Colombo, Aldo, to AGHIFUG S.a.S. di Bonomi Giacomo Marino and C. Corkscrew. 274,974, 8-7-84, Cl. D8-38.000.

Cornell, Larry L. Plumbing fitting. 275,027, 8-7-84, Cl. D23-40.000.

Coulon, Daniel: *See*—
Lacroix, Bernard; and Coulon, Daniel, 274,996, Cl. D12-110.000.

CPG Products Corp.: *See*—
Stolarz, Edward M., 274,976, Cl. D8-321.000.

Cycles Peugeot: *See*—
Lacroix, Bernard; and Coulon, Daniel, 274,996, Cl. D12-110.000.

Dalton, Murphy L., Jr. Subsurface outrigger for the detection of magnetic fields. 275,025, 8-7-84, Cl. D22-22.000.

Danielson, David C.; Genaro, Donald M.; and McGarvey, John N., to AT&T Bell Telephone Laboratories. Telephone handset. 275,006, 8-7-84, Cl. D14-63.000.

Dart Container Corporation: *See*—
Dart, William A.; and Dart, Kenneth B., 274,983, Cl. D9-447.000.

Dart, Kenneth B.: *See*—
Dart, William A.; and Dart, Kenneth B., 274,983, Cl. D9-447.000.

Dart, William A.; and Dart, Kenneth B., to Dart Container Corporation. Lid for a container. 274,983, 8-7-84, Cl. D9-447.000.

Dau, Georgeann C.: *See*—
Bohlman, Nadia N.; and Dau, Georgeann C., 274,960, Cl. D6-574.000.

Devine, J. Douglass. Bicycle lock. 274,977, 8-7-84, Cl. D8-331.000.

Diebold, Grant. Cigarette urn. 275,038, 8-7-84, Cl. D27-10.000.

Dolphin, Gary A., Sr.: *See*—
Hampshire, James F.; Dolphin, Gary A., Sr.; Yonkers, Ronald C.; and Terek, Greg P., 275,044, Cl. D34-21.000.

Drag Specialties, Inc.: *See*—
Preisler, James M., 274,978, Cl. D8-349.000.

Draheim, Harvey J.: *See*—
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 274,963, Cl. D6-446.000.

Drytek, Inc.: *See*—
Maher, Joseph A., Jr.; and Zafiropoulo, Arthur W., 275,032, Cl. D24-1.100.

Durand, Philippe J. Bowl or similar article. 274,970, 8-7-84, Cl. D7-28.000.

E.S. Originals Inc.: *See*—
Lee, J. Ryoung, 274,955, Cl. D2-309.000.

Fishel, Gerald C., to Gerico Fiberglass Products, Inc. Skimmer for hydrotherapy spa. 275,035, 8-7-84, Cl. D24-38.000.

Flosarite Corporation: *See*—
Loubier, Robert J., 275,039, Cl. D28-64.000.

Genaro, Donald M.; McGarvey, John N.; and Tilley, Alvin R., to AT&T Bell Laboratories. Telephone handset. 275,004, 8-7-84, Cl. D14-63.000.

Genaro, Donald M.; McGarvey, John N.; and Tilley, Alvin R., to AT&T Bell Laboratories. Telephone handset. 275,005, 8-7-84, Cl. D14-63.000.

Genaro, Donald M.: *See*—
Danielson, David C.; Genaro, Donald M.; and McGarvey, John N., 275,006, Cl. D14-63.000.

Gerico Fiberglass Products, Inc.: *See*—
Fishel, Gerald C., 275,035, Cl. D24-38.000.

Gioia, Michael C. Endoscopic instrument cabinet. 274,964, 8-7-84, Cl. D6-466.000.

Glembocki, Donald E.; and Novak, Lajos, to AT&T Technologies, Inc. Phone enclosure. 274,959, 8-7-84, Cl. D6-555.000.

Gomez, Antonia. Hand held back brush with rotary heads. 274,957, 8-7-84, Cl. D4-19.000.

Greene & Kellogg, Inc.: *See*—
McCombs, Norman R., 275,045, Cl. D34-28.000.

Grubb, Lawrence B.: *See—*
Simpson, Danny E.; Williams, D. Michael; Chase, Richard A.; and Grubb, Lawrence B., 275,022, Cl. D21-105.000.
Haenel, Max K.; Irelan, Edward A.; and Legler, John G., to Benchmark Tool Company. Bench sander. 275,014, 8-7-84, Cl. D15-124.000.
Hagland, Kerstin M.: *See—*
Lindstrom, Ingvar L.; Hagland, Kerstin M.; Hanses, Ulf M.; and Lindgren, Erik V., 274,968, Cl. D6-333.000.
Hampshire, James F.; Dolphin, Gary A., Sr.; Yonkers, Ronald C.; and Terek, Greg P., to Rubbermaid Commercial Products Inc. Utility cart. 275,044, 8-7-84, Cl. D34-21.000.
Hanses, Ulf M.: *See—*
Lindstrom, Ingvar L.; Hagland, Kerstin M.; Hanses, Ulf M.; and Lindgren, Erik V., 274,968, Cl. D6-333.000.
Hill, Royce W. Wing nut. 274,979, 8-7-84, Cl. D8-398.000.
Holloway, Thomas F., to Risdon Corporation. Cosmetic brush container. 275,040, 8-7-84, Cl. D28-76.000.
Horlogerie Photographique Francaise: *See—*
Martin, Honore , 275,008, Cl. D14-53.000.
Hoyt, Earl, to Airwick Industries, Inc. Combined bottle, cap and measuring cup. 274,981, 8-7-84, Cl. D9-337.000.
Huffman, Charles R. Artificial fish bait. 275,026, 8-7-84, Cl. D22-27.000.
Hunter, Richard S., to Novaprint. Compressed air or gas cylinder cradle. 274,982, 8-7-84, Cl. D9-424.000.
Ikeda, Seito. Toy bear baseball player. 275,024, 8-7-84, Cl. D21-159.000.
Irelan, Edward A.: *See—*
Haenel, Max K.; Irelan, Edward A.; and Legler, John G., 275,014, Cl. D15-124.000.
Jacobson Products Co.: *See—*
Mulay, Salvatore, 275,043, Cl. D32-73.000.
Johansson, Jan, to Aktiebolaget Halmstads Gummifabrik. Mat for an automobile. 274,998, 8-7-84, Cl. D12-203.000.
Johnson & Johnson Baby Products Company: *See—*
Simpson, Danny E.; Williams, D. Michael; Chase, Richard A.; and Grubb, Lawrence B., 275,022, Cl. D21-105.000.
Kabushiki Kaisha Sato: *See—*
Sato, Yo; and Kashiwaba, Tadao, 275,017, Cl. D18-19.000.
Kashiwaba, Tadao: *See—*
Sato, Yo; and Kashiwaba, Tadao, 275,017, Cl. D18-19.000.
Katzanek, Bernard: *See—*
Aronowitz, Robert; and Katzanek, Bernard, 274,958, Cl. D6-360.000.
Kelley, Kenneth; and Willets, Seth R. Medicine dispenser or similar article. 274,971, 8-7-84, Cl. D7-144.000.
Kessler, Ronald N.; Rose, June S.; and Ullman, Myron E., Jr., to Willow Molded Plastics, Inc.; and Rose, June S. Combined magazine, memo pad and pencil rack. 275,018, 8-7-84, Cl. D19-77.000.
King, Eddie W.: *See—*
Morgan, Annis R., Jr.; and King, Eddie W., 275,019, Cl. D20-5.000.
Lab-Line Instruments, Inc.: *See—*
Postlewait, Lester B., 275,033, Cl. D24-8.000.
Lacroix, Bernard; and Coulon, Daniel, to Cycles Peugeot. Motorcycle. 274,996, 8-7-84, Cl. D12-110.000.
Langsford, Peter C. Sheep handler. 275,041, 8-7-84, Cl. D30-99.000.
Larsson, Torsten, to Aktiebolaget Bofors. Tool carrier for excavators. 275,011, 8-7-84, Cl. D15-28.000.
Lee, J. Ryoung, to E.S. Originals Inc. Athletic shoe. 274,955, 8-7-84, Cl. D2-309.000.
Legler, John G.: *See—*
Haenel, Max K.; Irelan, Edward A.; and Legler, John G., 275,014, Cl. D15-124.000.
Leonard, Henri, to Micro-Mega S.A. Dental root-canal broach handle. 275,034, 8-7-84, Cl. D24-10.000.
Levin, Monte L., to Square D Company. Selectable tune door chime. 274,992, 8-7-84, Cl. D10-118.000.
Lindgren, Erik V.: *See—*
Lindstrom, Ingvar L.; Hagland, Kerstin M.; Hanses, Ulf M.; and Lindgren, Erik V., 274,968, Cl. D6-333.000.
Lindstrom, Ingvar L.; Hagland, Kerstin M.; Hanses, Ulf M.; and Lindgren, Erik V. Frame for a child's automobile seat. 274,968, 8-7-84, Cl. D6-333.000.
Lloyd-Jones, Robert. Cornice mould. 275,036, 8-7-84, Cl. D25-79.000.
Lonczak, John: *See—*
Stowell, Davin; Viemeister, Tucker; and Lonczak, John, 275,042, Cl. D32-70.000.
Loubier, Robert J., to Flossrite Corporation. Dental floss applicator. 275,039, 8-7-84, Cl. D28-64.000.
Machinefabriek Bewo B.V.: *See—*
van der Wouw, Cornelis A. M., 275,015, Cl. D15-133.000.
Maher, Joseph A., Jr.; and Zafiropoulo, Arthur W., to Drytek, Inc. Plasma cassette etcher. 275,032, 8-7-84, Cl. D24-1.100.
Mann, Billy F., Jr. Child's light switch extension. 274,972, 8-7-84, Cl. D8-14.000.
Martin, Honore , to Horlogerie Photographique Francaise. Telephone. 275,008, 8-7-84, Cl. D14-53.000.
Matsuo, Mototsugu. Apparatus for cutting by melting. 275,016, 8-7-84, Cl. D15-144.000.
McCombs, Norman R., to Greene & Kellogg, Inc. Combined bed and control unit for an industrial oxygen concentrator or the like. 275,045, 8-7-84, Cl. D34-28.000.
McGarvey, John N.: *See—*
Danielson, David C.; Genaro, Donald M.; and McGarvey, John N., 275,006, Cl. D14-63.000.
Genaro, Donald M.; McGarvey, John N.; and Tilley, Alvin R., 275,004, Cl. D14-63.000.
Genaro, Donald M.; McGarvey, John N.; and Tilley, Alvin R., 275,005, Cl. D14-63.000.
McLean, Richard K. Sail powered windmill. 275,010, 8-7-84, Cl. D15-1.000.
Mermelstein, Bernard. Digital clock. 274,985, 8-7-84, Cl. D10-6.000.
Mermelstein, Bernard. Digital clock. 274,986, 8-7-84, Cl. D10-6.000.
Mermelstein, Bernard. Digital clock. 274,987, 8-7-84, Cl. D10-8.000.
Mermelstein, Bernard. Digital clock. 274,988, 8-7-84, Cl. D10-8.000.
Mermelstein, Bernard. Digital clock. 274,989, 8-7-84, Cl. D10-9.000.
Micro-Mega S.A.: *See—*
Leonard, Henri, 275,034, Cl. D24-10.000.
Midgley, Raymond C. Collapsible storage bin. 275,046, 8-7-84, Cl. D34-40.000.
Milliken Research Corporation: *See—*
Ballinger, William H., 275,013, Cl. D15-78.000.
Milton Bradley International, Inc.: *See—*
Charves, Virginia; and Yee, Wayne J., 275,020, Cl. D21-16.000.
Mitutoyo Mfg. Co., Ltd.: *See—*
Yamamoto, Fumio; and Nakadoi, Tetsuya, 274,990, Cl. D10-73.000.
Morgan, Annis R., Jr.; and King, Eddie W., to Coca-Cola Company, The. Island vending machine. 275,019, 8-7-84, Cl. D20-5.000.
Morrison, Thurber H.: *See—*
Boldt, Melvin H.; Morrison, Thurber H.; and Stevens, James P., 275,029, Cl. D23-122.000.
Moyse, K. Robert, to Betz Laboratories, Inc. Liquid chemical container. 275,031, 8-7-84, Cl. D24-1.100.
Mulay, Salvatore, to Jacobson Products Co. Iron support. 275,043, 8-7-84, Cl. D32-73.000.
Nakadoi, Tetsuya: *See—*
Yamamoto, Fumio; and Nakadoi, Tetsuya, 274,990, Cl. D10-73.000.
National Presto Industries, Inc.: *See—*
Boldt, Melvin H.; Morrison, Thurber H.; and Stevens, James P., 275,029, Cl. D23-122.000.
Nippon Rubber Co., Ltd.: *See—*
Saruwatari, Katumitu, 274,956, Cl. D2-320.000.
Noonchester, Jerry J. Cabinet. 274,961, 8-7-84, Cl. D6-440.000.
Noonchester, Jerry J. Cabinet. 274,962, 8-7-84, Cl. D6-436.000.
Novak, Lajos: *See—*
Glembocki, Donald E.; and Novak, Lajos, 274,959, Cl. D6-555.000.
Novaprint: *See—*
Hunter, Richard S., 274,982, Cl. D9-424.000.
Nuttall, Michael W., to Tomy Kogyo Co., Inc. Toy automobile control console. 275,023, 8-7-84, Cl. D21-142.000.
Pahlanen, Matti. Modular flower stand and trellis combination. 274,966, 8-7-84, Cl. D6-405.000.
Pilux AG: *See—*
Wirtz, Peter, 274,991, Cl. D10-92.000.
Postlewait, Lester B., to Lab-Line Instruments, Inc. Laboratory water bath. 275,033, 8-7-84, Cl. D24-8.000.
Preisler, James M., to Drag Specialties, Inc. Motorcycle case guard light bracket. 274,978, 8-7-84, Cl. D8-349.000.
Reeves, Leo P. Circular wing aircraft. 274,999, 8-7-84, Cl. D12-325.000.
Resnick, Lynda R., to Teleflora Inc. Mirrored vase. 274,994, 8-7-84, Cl. D11-149.000.
Richards, Louis R.; and Stollery, David J., to Trihawk, Inc. Three wheel automotive passenger vehicle. 274,995, 8-7-84, Cl. D12-85.000.
Risdon Corporation: *See—*
Holloway, Thomas F., 275,040, Cl. D28-76.000.
Rose, June S.: *See—*
Kessler, Ronald N.; Rose, June S.; and Ullman, Myron E., Jr., 275,018, Cl. D19-77.000.
Rubbermaid Commercial Products Inc.: *See—*
Hampshire, James F.; Dolphin, Gary A., Sr.; Yonkers, Ronald C.; and Terek, Greg P., 275,044, Cl. D34-21.000.
Rubbermaid Incorporated: *See—*
Taylor, William D., 274,967, Cl. D6-510.000.
Saferstein, Albert; and Spector, Gilbert. Combined multifunction lamp and magnifier. 275,037, 8-7-84, Cl. D26-51.000.
Sanyei Corporation: *See—*
Stowell, Davin; Viemeister, Tucker; and Lonczak, John, 275,042, Cl. D32-70.000.
Saruwatari, Katumitu, to Nippon Rubber Co., Ltd. Shoe sole. 274,956, 8-7-84, Cl. D2-320.000.
Sato, Yo; and Kashiwaba, Tadao, to Kabushiki Kaisha Sato. Cassette for a rolled label strip. 275,017, 8-7-84, Cl. D18-19.000.
Schaffer, Michael J.: *See—*
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 274,963, Cl. D6-446.000.
Schmidt, Knud D. Stove. 275,028, 8-7-84, Cl. D23-97.000.
Schwartz, Frederic W., to Cable Electric Products, Inc. Portable retractable cord storage system. 275,000, 8-7-84, Cl. D13-30.000.
Schwartz, Frederic W., to Cable Electric Products, Inc. Portable retractable cord storage system. 275,001, 8-7-84, Cl. D13-30.000.
Schwartz, Frederic W., to Cable Electric Products, Inc. Portable retractable cord storage system. 275,002, 8-7-84, Cl. D13-30.000.
Schwartz, Frederic W., to Cable Electric Products, Inc. Portable retractable cord storage system. 275,003, 8-7-84, Cl. D13-30.000.
Shibata, Mikio, to Tokyo Shibaura Denki Kabushiki Kaisha. Keyboard-equipped arithmetic operation control machine for electronic computers. 275,009, 8-7-84, Cl. D14-100.000.
Silverman, Lee O. Radio. 275,007, 8-7-84, Cl. D14-69.000.
Simmons Universal Corporation: *See—*
Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., 274,963, Cl. D6-446.000.

Simpson, Danny E.; Williams, D. Michael; Chase, Richard A.; and Grubb, Lawrence B., to Johnson & Johnson Baby Products Company. Puzzle toy. 275,022, 8-7-84, Cl. D21-105.000.
Sonnek, Gerald L. Tractor tool box. 275,012, 8-7-84, Cl. D15-28.000.
Spang Industries Inc.: *See*—
Thornell, Ernest L., 274,984, Cl. D9-448.000.
Spector, Gilbert: *See*—
Saferstein, Albert; and Spector, Gilbert, 275,037, Cl. D26-51.000.
Square D Company: *See*—
Levin, Monte L., 274,992, Cl. D10-118.000.
Stevens, James P.: *See*—
Boldt, Melvin H.; Morrison, Thurber H.; and Stevens, James P., 275,029, Cl. D23-122.000.
Stolarz, Edward M., to CPG Products Corp. Handle post for luggage or the like. 274,976, 8-7-84, Cl. D8-321.000.
Stollery, David J.: *See*—
Richards, Louis R.; and Stollery, David J., 274,995, Cl. D12-85.000.
Stowell, Davin; Viemeister, Tucker; and Lonczak, John, to Sanyei Corporation. Travel iron. 275,042, 8-7-84, Cl. D32-70.000.
Syracuse China Corporation: *See*—
Unger, Steve A., 274,969, Cl. D7-9.000.
Taylor, William D., to Rubbermaid Incorporated. Storage bin. 274,967, 8-7-84, Cl. D6-510.000.
Teleflora Inc.: *See*—
Resnick, Lynda R., 274,994, Cl. D11-149.000.
Terek, Greg P.: *See*—
Hampshire, James F.; Dolphin, Gary A., Sr.; Yonkers, Ronald C.; and Terek, Greg P., 275,044, Cl. D34-21.000.
Thornell, Ernest L., to Spang Industries Inc. Beverage dispenser. 274,984, 8-7-84, Cl. D9-448.000.
Thorpe, Robert K., to Brown Jordan Company. Table. 274,965, 8-7-84, Cl. D6-484.000.
Tilley, Alvin R.: *See*—
Genaro, Donald M.; McGarvey, John N.; and Tilley, Alvin R., 275,004, Cl. D14-63.000.
Genaro, Donald M.; McGarvey, John N.; and Tilley, Alvin R., 275,005, Cl. D14-63.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Shibata, Mikio, 275,009, Cl. D14-100.000.
Tomita, Rioe. Magnetic door holder. 274,980, 8-7-84, Cl. D8-402.000.
Tomy Kogyo Co., Inc.: *See*—
Nuttall, Michael W., 275,023, Cl. D21-142.000.
Trihawk, Inc.: *See*—
Richards, Louis R.; and Stollery, David J., 274,995, Cl. D12-85.000.
Ullman, Myron E., Jr.: *See*—
Kessler, Ronald N.; Rose, June S.; and Ullman, Myron E., Jr., 275,018, Cl. D19-77.000.
Unger, Steve A., to Syracuse China Corporation. Cup or similar article. 274,969, 8-7-84, Cl. D7-9.000.
van der Wouw, Cornelis A. M., to Machinefabriek Bewo B.V. Protective hood for a circular saw. 275,015, 8-7-84, Cl. D15-133.000.
Viemeister, Tucker: *See*—
Stowell, Davin; Viemeister, Tucker; and Lonczak, John, 275,042, Cl. D32-70.000.
Waller, Adrian D. Wrench. 274,973, 8-7-84, Cl. D8-21.000.
Warrington Inc.: *See*—
Bourque, Rene, 274,954, Cl. D2-275.000.
Willets, Seth R.: *See*—
Kelley, Kenneth; and Willets, Seth R., 274,971, Cl. D7-144.000.
Williams, D. Michael: *See*—
Simpson, Danny E.; Williams, D. Michael; Chase, Richard A.; and Grubb, Lawrence B., 275,022, Cl. D21-105.000.
Willow Molded Plastics, Inc.: *See*—
Kessler, Ronald N.; Rose, June S.; and Ullman, Myron E., Jr., 275,018, Cl. D19-77.000.
Wilson, Louis A. Rotary bolster for truck or trailer. 274,997, 8-7-84, Cl. D12-159.000.
Wirtz, Peter, to Pilux AG. Electronic scale. 274,991, 8-7-84, Cl. D10-92.000.
Yamamoto, Fumio; and Nakadoi, Tetsuya, to Mitutoyo Mfg. Co., Ltd. Micrometer. 274,990, 8-7-84, Cl. D10-73.000.
Yee, Wayne J.: *See*—
Charves, Virginia; and Yee, Wayne J., 275,020, Cl. D21-16.000.
Yonkers, Ronald C.: *See*—
Hampshire, James F.; Dolphin, Gary A., Sr.; Yonkers, Ronald C.; and Terek, Greg P., 275,044, Cl. D34-21.000.
Zafiropoulo, Arthur W.: *See*—
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Bringhurst, Royce S.; and Voth, Victor, 5,267, Cl. 49.000.
Bringhurst, Royce S.; and Voth, Victor, 5,268, Cl. 48.000.
Voth, Victor: *See*—
Bringhurst, Royce S.; and Voth, Victor, 5,267, Cl. 49.000.
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NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

338 4,463,455
416 4,463,456

CLASS 3

13 Re.31,640
4,463,457
4,463,458
30 4,463,459

CLASS 4

191 4,463,460
288 4,463,461
605 4,463,462

CLASS 5

68 4,463,463
459 4,463,464
4,463,465
475 4,463,466

CLASS 8

151 4,463,467
557 4,464,180
639 4,464,181

CLASS 15

1.7 4,463,468
98 4,463,469
167 R 4,463,470
250.19 4,463,471
327 F 4,463,472
339 4,463,473
353 4,463,474

CLASS 16

241 4,463,475

CLASS 17

30 4,463,476
34 4,463,477
63 4,463,478

CLASS 19

48 A 4,463,479
159 A 4,463,480

CLASS 24

489 4,463,482

CLASS 26

29 P 4,463,483

CLASS 27

2 4,463,484

CLASS 28

161 4,463,486

CLASS 29

156.63 4,463,487
159.2 4,463,488
259 4,463,489
566.1 4,463,490
571 4,463,491
576 B 4,463,492
4,463,493

CLASS 30

90.4 4,463,494
142 4,463,495
180 4,463,496
252 4,463,497
296 R 4,463,498
382 4,463,499

CLASS 33

129 4,463,500
350 4,463,501

CLASS 34

1 4,463,502
172 4,463,503
175 4,463,504

CLASS 36

30 R 4,463,505
113 4,463,506

CLASS 37

117.5 4,463,507
142.5 4,463,508
193 4,463,509

CLASS 40

124.4 4,463,510

CLASS 43

21.2 4,463,511
22 4,463,512

CLASS 44

62 4,464,182

CLASS 47

1.5 4,463,521
58 4,463,522

CLASS 48

210 4,464,183

CLASS 49

478 4,463,523

CLASS 51

127 4,463,524
170 R 4,463,525

CLASS 52

83 4,463,526
103 4,463,527
109 Re.31,641
114 4,463,528
169.5 4,463,529
171 4,463,530
204 4,463,531
233 4,463,532
394 4,463,533
395 4,463,534
397 4,463,535
483 4,463,536
489 4,463,537
677 4,463,538
717 4,463,539
730 4,463,540

CLASS 53

447 4,463,541
479 4,463,542

CLASS 55

21 4,464,184
310 4,464,185
387 4,464,186
501 4,464,187

CLASS 56

17.1 4,463,544
44 4,463,543
337 4,463,545
364 4,463,546

CLASS 57

6 4,463,547
263 4,463,548
328 4,463,549

CLASS 59

84 4,463,550

CLASS 60

39.35 4,463,551
226.1 4,463,552
268 4,463,553
274 4,463,554
325 4,463,555
330 4,463,556
422 4,463,557
4,463,558
444 4,463,559
527 4,463,560
547.1 4,463,561
555 4,463,562
593 4,463,563
602 4,463,564
4,463,565
605 4,463,566
671 4,463,567
742 4,463,568

CLASS 62

3 4,463,569
13 4,464,188
24 4,464,189
4,464,190
31 4,464,191
101 4,463,570
126 4,463,571
135 4,463,572
157 4,463,573
175 4,463,574
184 4,463,575
228.3 4,463,576

CLASS 65

18.1 4,464,192

CLASS 66

64 4,463,577
75.1 4,463,578
4,463,579
84 A 4,463,580
87 4,463,581

CLASS 68

17 R 4,463,582
205 R 4,463,583

CLASS 70

63 4,463,584

CLASS 71

83 4,464,193
87 4,464,194
91 4,464,195

CLASS 72

10 4,463,585
17 4,463,586
43 4,463,587
98 4,463,588
273.5 4,463,589
354 4,463,590
360 4,463,591

CLASS 73

1 DV 4,463,592
19 4,463,593
23 4,463,594
28 4,463,595
35 4,463,596
40.5 R 4,463,597
55 4,463,598
61.1 R 4,463,599
81 4,463,600
118 4,463,601
153 4,463,602
168 4,463,603
296 4,463,604
432 SD 4,463,605
505 4,463,606
587 4,463,607
606 4,463,608
637 4,463,609
654 4,463,610
784 4,463,611
861.22 4,463,612
861.83 4,463,613
862.64 4,463,614
863.32 4,463,615
864.11 4,463,616

CLASS 74

3.5 4,463,617
10.33 4,463,618
4,463,619
200 4,463,620
330 4,463,621
337.5 4,463,622
473 R 4,463,623
493 4,463,624
4,463,625
4,463,626
569 4,463,627
861 4,463,628
862 4,463,629

CLASS 75

0.5 AA 4,464,196
11 4,464,197
130 R 4,464,198
249 4,464,199

CLASS 76

25 A 4,463,630

CLASS 81

3.1 R 4,463,631
177.9 4,463,632

CLASS 82

4 R 4,463,633
34 R 4,463,634
38 R 4,463,635

CLASS 83

13 4,463,636
40 4,463,637
62.1 4,463,638
71 4,463,639
116 4,463,640
175 4,463,641
530 4,463,642
703 4,463,643
745 4,463,644
852 4,463,645

CLASS 84

1.01 4,463,646
4,463,647
1.15 4,463,648
1.18 4,463,649
1.19 4,463,650
504 4,463,651

CLASS 87

1 4,463,652

CLASS 89

14.1 4,463,653
128 4,463,654
196 4,463,655

CLASS 91

20 4,463,656
44 4,463,657
388 4,463,658
404 4,463,659
469 4,463,660

CLASS 92

17 4,463,661
69 R 4,463,662
80 4,463,663

CLASS 99

322.3 4,463,664
488 4,463,665
497 4,463,666

CLASS 100

2 4,463,667
24 4,463,668
43 4,463,669
45 4,463,670

CLASS 101

35 4,463,671
93.09 4,463,672
129 4,463,673
148 4,463,674
157 4,463,675
212 4,463,676
426 4,463,677

CLASS 102

307 4,463,678
336 4,463,679
363 4,463,680
424 4,463,681

CLASS 104

12 4,463,682

CLASS 105

29 R 4,463,683

CLASS 106

90 4,464,200
4,464,201
139 4,464,202
308 N 4,464,203

CLASS 108

91 4,463,684

CLASS 109

12 4,463,685

CLASS 110

165 R 4,463,686
233 4,463,687
298 4,463,688
334 4,463,689
336 4,463,690
346 4,463,691

CLASS 112

102 4,463,692
128 4,463,693
158 A 4,463,694
199 4,463,695
200 4,463,696
262.3 4,463,697
275 4,463,698

CLASS 114

39 4,463,699
162 4,463,700
245 4,463,701

CLASS 116

63 R 4,463,702

CLASS 118

19 4,463,703
642 4,463,704

CLASS 119

45 R 4,463,705
51 R 4,463,706
97 R 4,463,707

CLASS 123

25 E 4,463,708
41.5 4,463,709
48 B 4,463,710
52 MV 4,463,711
90.17 4,463,712
90.55 4,463,713
90.57 4,463,714
146.5 A 4,463,715
198 DB 4,463,716
198 F 4,463,717
242 4,463,718
276 4,463,719
364 4,463,720
378 4,463,721
425 4,463,722
438 4,463,723
4,463,724
446 4,463,725
449 4,463,726
458 4,463,727
475 4,463,728
478 4,463,729
491 4,463,730
492 4,463,731
4,463,732
501 4,463,733
525 4,463,734
4,463,735
527 4,463,736
549 4,463,737
552 4,463,738
557 4,463,739
568 4,463,740
571 4,463,741
590 4,463,742
599 4,463,743
643 4,463,744

CLASS 124

6 4,463,745

CLASS 126

25 R 4,463,746
164 4,463,747
314 4,463,748
451 4,463,749

CLASS 127

36 4,464,204

CLASS 128

62 R 4,463,485
75 4,463,750
80 C 4,463,751
87 R 4,463,752
92 B 4,463,753
200.14 4,463,754
204.18 4,463,755
204.21 4,463,756
205.29 4,463,757
303 B 4,463,758
303.14 4,463,759
419 PG 4,463,760
581 4,463,761
633 4,463,762
661 4,463,763
719 4,463,764
785 4,463,765

CLASS 131

84 B 4,463,767
4,463,768
84 R 4,463,766
109 AB 4,463,769
329 4,463,770

CLASS 134

122 R 4,463,771

CLASS 137

15.2 4,463,772
38 4,463,773
81.1 4,463,774
111 4,463,775
495 4,463,776
553 4,463,777

CLASS 138

118.1 4,463,778
125 4,463,779
178 4,463,780

CLASS 139

1 E 4,463,781
55.1 4,463,782
435 4,463,783

CLASS 141

20 4,463,784

CLASS 144

1 F 4,463,785
133 A 4,463,786
193 R 4,463,787

CLASS 145

63 4,463,788

CLASS 148

11.5 P 4,464,205
4,464,206
16.6 4,464,207
31.55 4,464,208
36 4,464,209
162 4,464,210
171 4,464,211
187 4,464,212
442 4,464,213

CLASS 150

52 J 4,463,789

CLASS 156

61 4,464,214
71 4,464,215
162 4,464,216
164 4,464,217
244.12 4,464,218
251 4,464,219
273.3 4,464,220
484 4,464,221
613 4,464,222
643 4,464,223

CLASS 160

105 4,463,790
178 C 4,463,791
271 4,463,792

CLASS 162

111 4,464,224
181.6 4,464,225
358 4,464,226

CLASS 164

135 4,463,793
182 4,463,794
455 4,463,795
460 4,463,796
492 4,463,797

CLASS 165

1 4,463,798
10 4,463,799
11 R 4,463,800
43 4,463,801
104.32 4,463,802

CLASS 166

59 4,463,803
165 4,463,804
248 4,463,805
274 4,463,806

285 4,463,807
292 4,463,808
303 4,463,809
308 4,463,810

CLASS 172

26 4,463,811
136 4,463,812
205 4,463,813
821 Re.31,642

CLASS 174

35 C 4,464,540
84 C 4,464,541

CLASS 175

45 4,463,814
302 4,463,815

CLASS 177

119 4,463,816

CLASS 179

2 C 4,464,542
8 R 4,464,543
81 R Re.31,643
113 4,464,544
170.2 4,464,545

CLASS 180

65.5 4,463,817
89.15 4,463,818
132 4,463,819
143 4,463,820
168 4,463,821
177 4,463,822
226 4,463,823
227 4,463,824

CLASS 181

113 4,463,825

CLASS 182

20 4,463,826
93 4,463,827
136 4,463,828
160 4,463,829
238 4,463,830

CLASS 185

39 4,463,831

CLASS 187

9 R 4,463,832
29 R 4,463,833
4,463,834

CLASS 188

52 4,463,835
4,463,836
67 4,463,481
73.38 4,463,837
299 4,463,838
4,463,839

CLASS 190

18 A 4,463,840

CLASS 191

49 4,464,546

CLASS 192

0.052 4,463,842
18 A 4,463,841
111 A 4,463,843

CLASS 194

4 C 4,463,844

CLASS 198

341 4,463,845
399 4,463,846

CLASS 200

17 R 4,464,547
33 R 4,464,548
43 R 4,464,549
46 4,464,550
83 P 4,464,551

CLASS 202

170 4,464,227

CLASS 203

49 4,464,228
60 4,464,229

CLASS 204

1 T 4,464,230
9 4,464,231
28 4,464,232
59 QM 4,464,233
67 4,464,234
73 R 4,464,235
78 4,464,236
81 4,464,237
98 4,464,238
129 4,464,239
159.2 4,464,240
181 C 4,464,241
253 4,464,242
257 4,464,243
425 4,464,244

CLASS 206

205 4,463,847
214 4,463,848
307 4,463,849
309 4,463,850
328 4,463,851
427 4,463,852
569 4,464,552

CLASS 208

10 4,464,245
11 LE 4,464,246
11 R 4,464,247
44 4,464,248
65 4,464,249
120 4,464,250
221 4,464,251
243 4,464,252

CLASS 210

112 4,464,253
136 4,464,254
4,464,255
149 4,464,256
195.1 4,464,257
205 4,464,258
219 4,464,259
232 4,464,260
282 4,464,261
291 4,464,262
484 4,464,263
512.1 4,464,264
517 4,464,265
703 4,464,266

CLASS 211

37 4,463,853
43 4,463,854
71 4,463,855
163 4,463,856

CLASS 212

166 4,463,857
176 4,463,858

CLASS 215

11 R 4,463,859
12 R 4,463,860
4,463,861
33 4,463,862
343 4,463,863

CLASS 219

10.49 R 4,464,553
10.55 F 4,464,554
69 R 4,464,555
113 4,464,556
121 LM 4,464,557
130.21 4,464,558
130.51 4,464,559
137.42 4,464,560
216 4,464,561
225 4,464,562
298 4,464,563
497 4,464,564
550 4,464,565

CLASS 220

4 F 4,463,864
89 A 4,463,865
269 4,463,866
270 4,463,867
288 4,463,868
307 4,463,869
4,463,870
378 4,463,871
428 4,463,872

CLASS 221

12 4,463,873
238 4,463,874

CLASS 222

82 4,463,875
94 4,463,876
146 HE 4,463,877
153 4,463,878
175 4,463,879
189 4,463,880
375 4,463,881
543 4,463,882

CLASS 224

42.44 4,463,883
243 4,463,884
250 4,463,885

CLASS 225

96.5 4,463,886

CLASS 227

7 4,463,887
109 4,463,888
112 4,463,889
132 4,463,890

CLASS 228

180 R 4,463,891
212 4,463,892

CLASS 229

43 4,463,893
44 EC 4,463,894
49 4,463,895

CLASS 235

382 4,464,566

CLASS 236

49 4,463,896
92 R 4,463,897

CLASS 238

310 4,463,898

CLASS 239

75 4,463,899
88 4,463,900
95 4,463,901
265.17 4,463,902
4,463,903
284 R 4,463,904
329 4,463,905
720 4,463,906

CLASS 241

92 4,463,907
207 4,463,908

CLASS 242

35.5 A 4,463,909
47.12 4,463,910
55.2 4,463,911
55.42 4,463,912
57 4,463,913
84.1 J 4,463,914
84.2 A 4,463,916
84.2 G 4,463,917
107.4 A 4,463,917
199 4,463,918

CLASS 244

3.22 4,463,921
134 A 4,463,919
207 4,463,920

CLASS 248

429 4,463,922
546 4,463,923
553 4,463,924

CLASS 249

11 4,463,925
47 4,463,926
95 4,463,927

CLASS 250

204 4,464,567
253 4,464,568
270 4,464,569
291 4,464,570
305 4,464,571
338 4,464,572
396 R 4,464,573
432 PD 4,464,574
554 4,464,575

CLASS 251

6 4,463,928
44 4,463,929
134 4,463,930
298 4,463,931

CLASS 252

8.05 4,464,267
8.55 B 4,464,268
8.55 R 4,464,269
4,464,270
8.6 4,464,271
8.8 4,464,272
4,464,273
28 4,464,274
32.7 E 4,464,275
33.4 4,464,289
42.7 4,464,276
56 S 4,464,277
62.54 4,464,278
4,464,279
174.11 4,464,280
174.21 4,464,281
299.1 4,464,282
299.63 4,464,283
301.21 4,464,284
311.5 4,464,285
4,464,286
312 4,464,287
4,464,288
522 R 4,464,290
4,464,291
532 4,464,292
547 4,464,293
629 4,464,294

CLASS 254

266 4,463,932
368 4,463,933

CLASS 256

13.1 4,463,934

CLASS 260

112 R 4,464,295
123.5 4,464,296
185 4,464,297
239.55 C 4,464,298
245.2 T 4,464,299
245.5 4,464,300
351 4,464,301
397.1 4,464,302
410 4,464,303
4,464,304
412 4,464,305
429 J 4,464,306
544 N 4,464,307
969 4,464,308

CLASS 261

23 R 4,464,309
39 E 4,464,310
44 C 4,464,311
70 4,464,312
78 R 4,464,313
79 A 4,464,314
110 4,464,315
121 R 4,464,316

CLASS 264

4.3 4,464,317
40.1 4,464,318
4,464,319
45.3 4,464,320
83 4,464,321
138 4,464,322
187 4,464,323
221 4,464,324
229 4,464,325
246 4,464,326
328.8 4,464,327
521 4,464,328
544 4,464,329

CLASS 266

233 4,463,935

CLASS 267

36 A 4,463,936

CLASS 269

17 4,463,937
48.1 4,463,938

CLASS 270

1.1 4,463,939
54 4,463,940
4,463,941

CLASS 271

12 4,463,942
21 4,463,943
200 4,463,944

CLASS 272

73 4,463,945
111 4,463,946
116 4,463,947
136 4,463,948

CLASS 273

1 GI 4,463,949
26 R 4,463,950
58 A 4,463,951
236 4,463,952
418 4,463,953
424 4,463,954

CLASS 277

1 4,463,955
12 4,463,956
34 4,463,957
84 4,463,958
230 4,463,959

CLASS 279

60 4,463,960

CLASS 280

3 4,463,961
164 R 4,463,962
253 4,463,963
284 4,463,964
414.1 4,463,965
442 4,463,966
605 4,463,967
612 4,463,968
707 4,463,969

CLASS 283

72 4,463,970
83 4,463,971

CLASS 285

175 4,463,972
298 4,463,973
323 4,463,974
419 4,463,975

CLASS 290

38 R 4,464,576
40 A 4,464,577
42 4,464,578
44 4,464,579
52 4,464,580

CLASS 292

202 4,463,976

CLASS 294

26 4,463,977
31.2 4,463,978
62 4,463,979
64 R 4,463,980
100 4,463,981

CLASS 296

170 4,463,982
213 4,463,983

CLASS 297

250 4,463,984
433 4,463,985

CLASS 299

1 4,463,986
2 4,463,987
4,463,988
39 4,463,989

CLASS 301

37 SS 4,463,990

CLASS 303

69 4,463,991

CLASS 307

118 4,464,582
147 4,464,583
200 A 4,464,584
252 C 4,464,585
265 4,464,581
271 4,464,586
279 4,464,587
297 4,464,588
477 4,464,589
530 4,464,590
4,464,591

CLASS 308

6 C 4,463,992
184 R 4,463,993
196 4,463,994
207 R 4,463,995

CLASS 310

34 4,464,592
58 4,464,593
63 4,464,594
154 4,464,595
156 4,464,596
313 B 4,464,597
344 4,464,598
348 4,464,599

CLASS 312

9 4,463,996
259 4,463,997

CLASS 313

318 4,464,600
403 4,464,601
509 4,464,602
624 4,464,603

CLASS 315

79 4,464,604
134 4,464,605
158 4,464,606
209 K 4,464,607
241 P 4,464,608
4,464,609
291 4,464,610
366 4,464,611
408 4,464,612

CLASS 318

119 4,464,613
571 4,464,614
625 4,464,615
696 4,464,616
717 4,464,617
794 4,464,618

CLASS 320

40 4,464,619

CLASS 323

300 4,464,620

CLASS 324

52 4,464,621
67 4,464,622
72.5 4,464,623
77 K 4,464,624
117 R 4,464,625
156 4,464,626
158 R 4,464,627
418 4,464,628

CLASS 330

6 4,464,629
107 4,464,630
253 4,464,631
254 4,464,632
4,464,633
264 4,464,634
284 4,464,635
300 4,464,636
426 4,464,637

CLASS 331

1 A 4,464,638

CLASS 333

154 4,464,639
202 4,464,640

CLASS 335

23 4,464,641
201 4,464,642
213 4,464,643

CLASS 336

90 4,464,644
135 4,464,645

CLASS 338

25 4,464,646
35 4,464,647

CLASS 339

40 4,463,998
75 P 4,463,999
89 M 4,464,000
90 R 4,464,001
97 P 4,464,002
99 R 4,464,003
111 4,464,004
112 R 4,464,005
126 R 4,464,006
220 T 4,464,007
226 4,464,008
252 R 4,464,009
272 R 4,464,010

CLASS 340

51 4,464,648
72 4,464,649
347 DD 4,464,650
501 4,464,653
521 4,464,651
676 4,464,654
710 4,464,652
715 4,464,655
728 4,464,656
776 4,464,657
825.5 4,464,658
825.7 4,464,659
870.38 4,464,660
960 4,464,661

CLASS 343

16 R 4,464,662
700 MS 4,464,663
715 4,464,664
769 4,464,665
781 P 4,464,666

CLASS 346

74.2 4,464,667
75 4,464,668
76 PH 4,464,669
137 4,464,670
140 A 4,464,671
153.1 4,464,672

CLASS 350

6.1 4,464,011
96.16 4,464,012
96.23 4,464,013
105 4,464,014
138 4,464,015
289 4,464,016
307 4,464,017
331 R 4,464,018
4,464,019
350 S 4,464,020
354 4,464,021
377 4,464,022
464 4,464,023
465 4,464,024

CLASS 351

106 4,464,025
160 R 4,464,026
203 4,464,027

CLASS 352
65 4,464,028
69 4,464,029

CLASS 354
4 4,464,030
173.1 4,464,031
234.1 4,464,032
266 4,464,033
286 4,464,034
299 4,464,035
324 4,464,036
400 4,464,037
403 4,464,038
418 4,464,039
455 4,464,040

CLASS 355
3 DD 4,464,041
3 SH 4,464,042
14 C 4,464,043
14 R 4,464,044
38 4,464,045
57 4,464,046
93 4,464,047

CLASS 356
5 4,464,048
218 4,464,049
237 4,464,050
323 4,464,051
347 4,464,052
376 4,464,053
406 4,464,054

CLASS 357
38 4,464,673

CLASS 358
21 R 4,464,674
31 4,464,675
37 4,464,676
75 4,464,677
122 4,464,678
148 4,464,679
218 4,464,680
285 4,464,681
288 4,464,682
310 4,464,683
4,464,684
4,464,685
314 4,464,686

CLASS 360
2 4,464,687
78 4,464,689
84 4,464,690
111 4,464,691
133 4,464,692
4,464,693
137 4,464,694
4,464,695

CLASS 361
42 4,464,696
64 4,464,697
79 4,464,698
296 4,464,699
307 4,464,700
313 4,464,701
328 4,464,702
342 4,464,703
414 4,464,704

CLASS 362
12 4,464,705
193 4,464,706
222 4,464,707
300 4,464,708

CLASS 363
16 4,464,709
22 4,464,710
87 4,464,711

CLASS 364
200 4,464,712
4,464,713
4,464,714
4,464,715
4,464,716
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4,464,718
300 4,464,719
431.02 4,464,720
451 4,464,721
492 4,464,724
551 4,464,722
571 4,464,723
4,464,725
606 4,464,726
718 4,464,727
786 4,464,728
787 4,464,729
900 4,464,730
4,464,731
4,464,732
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CLASS 365
51 4,464,734
190 4,464,735
200 4,464,736

CLASS 366
26 4,464,055
134 4,464,056
139 4,464,057

CLASS 367
49 4,464,737
97 4,464,738
130 4,464,739

CLASS 368
21 4,464,058
63 4,464,059
96 4,464,060
202 4,464,061
220 4,464,062
276 4,464,063

CLASS 369
41 4,464,740
45 4,464,741
71 4,464,742
75.2 4,464,743
264 4,464,744

CLASS 370
19 4,464,745
32 4,464,746
58 4,464,748
85 4,464,749

CLASS 371
21 4,464,750
29 4,464,751
38 4,464,752
4,464,753
50 4,464,747
51 4,464,754
4,464,755
63 4,464,756
71 4,464,757

CLASS 372
11 4,464,758
18 4,464,759
38 4,464,760
41 4,464,761
50 4,464,762
107 4,464,763

CLASS 373
87 4,464,764

CLASS 374
101 4,464,064
121 4,464,065
141 4,464,066
170 4,464,067

CLASS 375
17 4,464,765
49 4,464,766
67 4,464,767
101 4,464,768
110 4,464,769
119 4,464,770
120 4,464,771

CLASS 376
159 4,464,330
202 4,464,331
215 4,464,332
280 4,464,333
298 4,464,334

CLASS 377
47 4,464,772
116 4,464,773
117 4,464,774

CLASS 378
5 4,464,775
010 4,464,776
146 4,464,777
150 4,464,778
176 4,464,779
178 4,464,780

CLASS 381
12 4,464,781
31 4,464,782
4,464,783
61 4,464,784
117 4,464,785

CLASS 382
7 4,464,786
4,464,787
41 4,464,788
48 4,464,789

CLASS 383
37 4,464,790

CLASS 384
103 4,464,068

CLASS 400
83 4,464,069
98 4,464,070
144.2 4,464,071

CLASS 401
137 4,464,072

CLASS 403
170 4,464,073
192 4,464,074
231 4,464,075
297 4,464,076
316 4,464,077
351 4,464,078

CLASS 405
37 4,464,079
76 4,464,080
128 4,464,081
157 4,464,082
216 4,464,083
288 4,464,084

CLASS 407
25 4,464,086
105 4,464,085
113 4,464,087

CLASS 408
182 4,464,088

CLASS 410
97 4,464,089

CLASS 411
103 4,464,090
105 4,464,091

CLASS 414
534 4,464,092
687 4,464,093

CLASS 415
217 4,464,094

CLASS 416
128 4,464,095
215 4,464,096
230 4,464,097

CLASS 417
397 4,464,098
510 4,464,099

CLASS 418
55 4,464,100
125 4,464,101
179 4,464,102

CLASS 420
584 4,464,335

CLASS 422
24 4,464,336
41 4,464,337
78 4,464,338
94 4,464,339
103 4,464,340
202 4,464,341
247 4,464,342

CLASS 423
3 4,464,343
5 4,464,344
7 4,464,345
10 4,464,346
112 4,464,347
150 4,464,348
213.2 4,464,349
244 4,464,350
486 4,464,351
634 4,464,352
640 4,464,353

CLASS 424
59 4,464,354
101 4,464,355
106 4,464,356
162 4,464,357
177 4,464,358
180 4,464,359
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4,464,361
195 4,464,362
232 4,464,363
241 4,464,364
243 4,464,365
246 4,464,366
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248.4 4,464,370
250 4,464,371
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251 4,464,374
253 4,464,375
256 4,464,376
260 4,464,377
263 4,464,378
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269 4,464,381
270 4,464,382
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273 P 4,464,386
273 R 4,464,385
4,464,387
275 4,464,388
278 4,464,389
300 4,464,390
304 4,464,391
313 4,464,392
316 4,464,393
317 4,464,394
319 4,464,395
4,464,396
4,464,397
329 4,464,398
342 4,464,399
365 4,464,400

CLASS 425
7 4,464,103
192 R 4,464,104
364 R 4,464,105
525 4,464,106

CLASS 426
238 4,464,401
242 4,464,402
271 4,464,403
332 4,464,404
391 4,464,405
496 4,464,406
533 4,464,407
535 4,464,408
536 4,464,409
573 4,464,410
613 4,464,411

CLASS 427
2 4,464,412
6 4,464,413
37 4,464,414
39 4,464,415
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41 4,464,417
44 4,464,418
58 4,464,419
96 4,464,420
102 4,464,421
124 4,464,422
244 4,464,423
296 4,464,424

CLASS 428
35 4,464,425
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40 4,464,427
95 4,464,428
117 4,464,429
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402.22 4,464,434
409 4,464,435
458 4,464,437
463 4,464,436
516 4,464,438
517 4,464,439
542.4 4,464,440
579 4,464,441
654 4,464,442
688 4,464,443

CLASS 429
13 4,464,444
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190 4,464,446
194 4,464,447

CLASS 430
22 4,464,448
54 4,464,449
59 4,464,450
65 4,464,451
110 4,464,452
126 4,464,453
256 4,464,454
270 4,464,455
281 4,464,456
288 4,464,457
312 4,464,458
313 4,464,459
323 4,464,460
326 4,464,461
512 4,464,462
4,464,463
546 4,464,464

CLASS 431
264 4,464,107
265 4,464,108
344 4,464,109
350 4,464,110

CLASS 432
24 4,464,111
106 4,464,112

CLASS 433
77 4,464,113
229 4,464,114

CLASS 434
27 4,464,115
33 4,464,116
67 4,464,117
85 4,464,118
185 4,464,119
219 4,464,120
236 4,464,121
262 4,464,122
268 4,464,123
321 4,464,124
330 4,464,125

CLASS 435
68 4,464,465
92 4,464,466
119 4,464,467
172.3 4,464,473
177 4,464,468
188 4,464,469
253 4,464,470
4,464,471
255 4,464,472

CLASS 436
513 4,464,474

CLASS 440
15 4,464,126
74 4,464,127
112 4,464,128

CLASS 441
16 4,464,129
25 4,464,130
29 4,464,131
81 4,464,132

CLASS 443
9 4,464,133
24 4,464,134
25 4,464,135

CLASS 446
222 4,463,513
237 4,463,518
294 4,463,514
320 4,463,516
409 4,463,515
421 4,463,517
443 4,463,519
4,463,520

CLASS 455
67 4,464,791
128 4,464,792
154 4,464,793
157 4,464,794

CLASS 464
14 4,464,136
48 4,464,137
56 4,464,138
69 4,464,139
71 4,464,140
75 4,464,141
92 4,464,142
146 4,464,143

CLASS 474
14 4,464,144
28 4,464,145
133 4,464,146
135 4,464,147
167 4,464,148
185 4,464,149
195 4,464,150
231 4,464,151
245 4,464,152
270 4,464,153

CLASS 493
87 4,464,154
137 4,464,155
194 4,464,156
211 4,464,157
265 4,464,158
419 4,464,159
448 4,464,160

CLASS 494
7 4,464,161
53 4,464,162
64 4,464,163

CLASS 501
9 4,464,475

CLASS 502
6 4,464,476
24 4,464,477
111 4,464,478
185 4,464,479
207 4,464,480
228 4,464,481
325 4,464,482

CLASS 518
703 4,464,483

CLASS 521
38 4,464,484
64 4,464,485
83 4,464,486
90 4,464,487
115 4,464,488
117 4,464,489
128 4,464,490
134 4,464,491

CLASS 523
139 4,464,492
319 4,464,493
400 4,464,494

CLASS 524
87 4,464,495
91 4,464,496
114 4,464,497
145 4,464,498
230 4,464,499
258 4,464,500
410 4,464,501
411 4,464,502
425 4,464,503
443 4,464,504
512 4,464,505
588 4,464,506
710 4,464,507
787 4,464,508

CLASS 525
53 4,464,509
54.23 4,464,510
61 4,464,511
146 4,464,512
227 4,464,513
238 4,464,514
338 4,464,515

CLASS 526
62 4,464,516
88 4,464,517
127 4,464,518
200 4,464,519
262 4,464,520
273 4,464,521
301 4,464,522
313 4,464,524

CLASS 527
300 4,464,523

CLASS 528
9 4,464,525
358 4,464,526

CLASS 536
6.4 4,464,529
7.4 4,464,527
17.4 4,464,531
50 4,464,528
124 4,464,530

CLASS 544
237 4,464,532
354 4,464,533

CLASS 546
51 4,464,534
4,464,535
213 4,464,536

CLASS 548
211 4,464,537

CLASS 549
20 4,464,538

CLASS 560
212 4,464,539

CLASS 604
5 4,464,164
4,464,165
6 4,464,166
4,464,167
9 4,464,168
26 4,464,169
50 4,464,170
53 4,464,171
65 4,464,172
89 4,464,173
90 4,464,174
99 4,464,175
164 4,464,176
168 4,464,177
174 4,464,178
250 4,464,179

D2—	275	274,954		28	274,970			274,986			275,002	D19—	77	275,018		10	275,034
	309	274,955		144	274,971		8	274,987			275,003	D20—	5	275,019		38	275,035
	320	274,956	D8—	14	274,972			274,988	D14—	53	275,008	D21—	16	275,020	D25—	79	275,036
D4—	19	274,957		21	274,973		9	274,989		63	275,004		91	275,021	D26—	51	275,037
D6—	333	274,968		38	274,974		73	274,990			275,005		105	275,022	D27—	10	275,038
	360	274,958		71	274,975		92	274,991			275,006		142	275,023	D28—	64	275,039
	405	274,966		321	274,976		118	274,992		69	275,007		159	275,024		76	275,040
	436	274,962		331	274,977	D11—	131	274,993		100	275,009	D22—	22	275,025	D30—	99	275,041
	440	274,961		349	274,978		149	274,994	D15—	1	275,010		27	275,026	D32—	70	275,042
	446	274,963		398	274,979	D12—	85	274,995		28	275,011	D23—	40	275,027		73	275,043
	466	274,964		402	274,980		110	274,996			275,012		97	275,028	D34—	21	275,044
	484	274,965	D9—	337	274,981		159	274,997		78	275,013		122	275,029		28	275,045
	510	274,967		424	274,982		203	274,998		124	275,014		139	275,030		40	275,046
	555	274,959		447	274,983		325	274,999		133	275,015	D24—	1.1	275,031			275,047
	574	274,960		448	274,984	D13—	30	275,000		144	275,016			275,032		44	275,048
D7—	9	274,969	D10—	6	274,985			275,001	D18—	19	275,017		8	275,033			

CLASSIFICATION OF PLANTS

P.—	48	5,268		49	5,267		77	5,269			

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

71—	34	T104,501	156—	244.11	T104,502						

GEOGRAPHICAL INDEX

OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	4,463,680		4,464,018		4,464,728		4,464,500		4,464,204	19 :	4,463,543
	4,464,073		4,464,019		4,464,732		4,464,630		4,464,217		4,463,557
04 :	4,463,498		4,464,027		4,464,760		4,464,631		4,464,228		4,463,558
	4,463,525		4,464,028		4,464,763		4,464,653		4,464,234		4,463,622
	4,463,545		4,464,052		4,464,774		4,464,697		4,464,249		4,463,628
	4,463,569		4,464,090	08 :	4,463,529		4,464,718		4,464,277		4,463,659
	4,463,897		4,464,091		4,463,779		4,464,767		4,464,288		4,463,674
	4,463,927		4,464,111		4,463,807	13 :	4,463,663		4,464,316		4,463,733
	4,463,977		4,464,134		4,463,844		4,463,664		4,464,350		4,463,775
	4,464,079		4,464,155		4,464,509		4,463,669		4,464,426		4,463,811
	4,464,563		4,464,159		4,464,663		4,463,854		4,464,436		4,463,813
	4,464,713		4,464,165	09 :	4,463,482		4,463,902		4,464,443		4,463,864
	4,464,724		4,464,168		4,463,552		4,463,903		4,464,445		4,464,149
	4,464,736		4,464,175		4,463,639		4,463,953		4,464,476	20 :	4,463,509
	4,464,748		4,464,179		4,463,729		4,463,981		4,464,480		4,463,563
06 :	4,463,458		4,464,194		4,463,792		4,464,013		4,464,481		4,463,699
	4,463,462		4,464,207		4,463,846		4,464,189		4,464,512		4,463,736
	4,463,465		4,464,223		4,463,885		4,464,254		4,464,524		4,463,949
	4,463,474		4,464,267		4,463,994		4,464,648		4,464,551		4,464,363
	4,463,496		4,464,306		4,463,999	15 :	4,464,122		4,464,557		4,464,440
	4,463,502		4,464,307		4,464,015	16 :	4,463,912		4,464,604	21 :	4,463,575
	4,463,518		4,464,309		4,464,021	17 :	Re.31,642		4,464,635		4,463,832
	4,463,537		4,464,327		4,464,051		4,463,460		4,464,636		4,463,947
	4,463,544		4,464,374		4,464,058		4,463,515		4,464,658		4,464,070
	4,463,547		4,464,389		4,464,072		4,463,534		4,464,681		4,464,250
	4,463,564		4,464,399		4,464,096		4,463,535		4,464,689		4,464,378
	4,463,567		4,464,405		4,464,172		4,463,546		4,464,780		4,464,554
	4,463,584		4,464,460		4,464,173		4,463,574		4,464,787	22 :	4,463,930
	4,463,606		4,464,470		4,464,174		4,463,629		4,464,791		4,464,127
	4,463,615		4,464,472		4,464,192		4,463,632	18 :	4,463,466		4,464,236
	4,463,648		4,464,473		4,464,333		4,463,644		4,463,499		4,464,252
	4,463,654		4,464,494		4,464,407		4,463,645		4,463,503		4,464,296
	4,463,708		4,464,529		4,464,491		4,463,689		4,463,504		4,464,392
	4,463,710		4,464,540		4,464,502		4,463,691		4,463,528		4,464,493
	4,463,749		4,464,548		4,464,527		4,463,696		4,463,550	23 :	4,463,560
	4,463,750		4,464,567		4,464,569		4,463,704		4,463,631		4,463,797
	4,463,780		4,464,572		4,464,671		4,463,738		4,463,748	24 :	4,463,701
	4,463,789		4,464,586		4,464,707		4,463,746		4,463,843		4,463,739
	4,463,798		4,464,588		4,464,739		4,463,778		4,463,849		4,463,904
	4,463,800		4,464,590		4,464,758		4,463,785		4,463,901		4,463,920
	4,463,809		4,464,591	10 :	4,464,196		4,463,835		4,463,956		4,464,054
	4,463,814		4,464,592		4,464,323		4,463,836		4,463,982		4,464,065
	4,463,816		4,464,622		4,464,667		4,463,867		4,464,016		4,464,141
	4,463,859		4,464,624	12 :	4,463,541		4,463,882		4,464,142		4,464,191
	4,463,866		4,464,639		4,463,762		4,463,888		4,464,170		4,464,215
	4,463,880		4,464,652		4,463,765		4,463,911		4,464,184		4,464,349
	4,463,892		4,464,657		4,463,923		4,463,925		4,464,205		4,464,390
	4,463,896		4,464,660		4,463,954		4,463,942		4,464,206		4,464,637
	4,463,924		4,464,676		4,463,978		4,463,974		4,464,398		4,464,768
	4,463,944		4,464,687		4,464,123		4,463,985		4,464,492		4,464,785
	4,463,968		4,464,715		4,464,126		4,464,074		4,464,497	25 :	4,463,491
	4,463,992		4,464,719		4,464,164		4,464,075		4,464,742		4,463,505
	4,464,006		4,464,727		4,464,177		4,464,178		4,464,744		4,463,588

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04 : 275,030
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274,979
274,984
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274,977
274,994
274,997
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275,001
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48 : 275,025
50 : 274,993
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275,044
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PLANT PATENTS

06 : 5,267

5,268

5,269

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